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CHARLES C. LITTLE AND JAMES BROWN.
MDCCCXXXIX.

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BOSTON

JOURNAL OF NATURAL HISTORY.

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ART. I.—DESCRIPTION OF NEW SPECIES OF COLEOPTEROUS INSECTS INHABITING THE STATE OF MAINE. By J. W. Randall. Communicated Oct. 18, 1837.

In the following paper I offer a few of the many apparently undescribed species of Coleoptera selected from a collection of insects, obtained by me in various journeys to different parts of the State, during a fifteen months' residence at Hallowell, Maine.

---

1. Patrobus angicollis.

P. corpore atro; capite transversè subrugoso; antennis subpilosis, nigris; thorace sub-depresso, profundè inequaliterque canaliculato, transversè rugoso; elytris depressis, striatis; femoribus tibiisque nigris, geniculis tarsisque piceis.

Body elongated, black: *head* profoundly and unequally channeled, with a few transverse wrinkles; intermediate spaces smooth, convex: *eyes* small, black, very little prominent: *palpi* piceous: *mandibles* black, not very stout: *antennæ* long, a little hairy: *thorax* transversely rugose, much flattened, especially on the sides, median line profoundly and rather unequally impressed; anteriorly with a transverse, curved depression; region about the base, rather profoundly punctured; sides, obscurely so; posterior cavities, very rugose: *elytra* a good deal depressed, with punctured striæ; intermediate spaces somewhat flattened: *thighs* and *tibiæ* black: *knees* and *feet* piceous, the latter somewhat hairy beneath.

Length nine twentieths of an inch.

Under the bark of prostrate, decaying hemlock trees. Hallowell.

Distinguishable at once from P. *longicòrnis*, by its elongated, depressed body, and by its transverse wrinkles very conspicuous in some lights, when viewed through a glass sideways.

2. AGONUM ANCHOMENOIDES.

A. corpore gracili, capite viridi-nitido; palpis pallidis; thorace subviridi-nitido, lateribus testaceis; elytris æneo-fuscis, margine testacea, striis leviter impressis, stria secunda punctis duobus, tertia tribus impressis; femoribus, tibiis, tarsisque penitus testaceis.

Body slender, head green, metallic: *eyes* pale brownish: *mandibles* piceous: *palpi* pale, last joint darker: three first joints of the *antennæ* pale, the rest darker: *thorax* longer than broad, nearly cordiform, hardly smooth; median furrow profoundly impressed; color, metallic green, sides testaceous, especially towards the posterior angles, which are abruptly rounded: *elytra* somewhat pale fuscous, tinged with metallic green; striæ narrow, not deeply, but plainly impressed, hardly punctured; margin testaceous, with several large, black impressed spots; second stria with two large punctur behind the middle, third, with three before and at t middle, placed somewhat laterally, so as to occupy part of the intermediate space between the second and third: *Body* beneath, greenish black: *legs* entirely pale.

Length above five twentieths of an inch.

Inhabits Augusta. June.

It approaches Anchomenus in the abruptly rounded thoracic angles.

3. FERONIA (Pterostichus) PUNCTATISSIMA.

F. corpore nigro; antennis subfuscis; thorace profundè canaliculato, transversè rugoso, posticè utrinque profundè impresso, impressionibus punctulatis; elytris profundè punctulato-striatis; tarsis subtus pilosis.

Body black, subdilated: *front* profoundly and irregularly channeled; puncture before the eyes very large and rough: *antennæ* becoming gradually pilose; somewhat fuscous towards the extremities: *thorax* profoundly channeled, transversely rugose especially before the middle; posterior impressions broad, deep and produced very far along the lateral margin: *elytra* profoundly and very irregularly striate; striæ with numerous great punctures, generally elongated and constantly interrupting the intermediate spaces, which are convex, smooth, alternately narrow without punctures, and broad, with large irregular punctures, presenting to the naked eye a catenated appearance: body *beneath* polished, hardly punctured: *legs* black: *feet* underneath, very pilose, somewhat fuscous.

Length about thirteen twentieths of an inch.

A single specimen of this remarkable insect, occurred early in June, near the summit of the Blue Mountains, in the decayed stump of a tree. It is difficult to determine whether it should be placed among the Omasei, with which it agrees in general form, or in the section Pterostichus, to which the almost imperceptible ridge upon the apex beneath, would seem to refer it.

Judging by their respective descriptions, it seems to be allied to the *Hárpalus Dréscheri* of Fischer (*Pteróstichus Dréscheri*, Dej.) and to the *Ferònia cribràta*, Bonelli, both of Europe.

4. BUPRESTIS INORNATA.

B. corpore brevi, subdilatato, subcupreo; antennis nigro-viridibus, nitidis; thorace dilatato, densè punctulato, medio utrinque bi-impresso; elytris densè profundèque punctulatis; subtus punctulato, ad apicem nigro-viridi, nitido.

Body short, subdilated: *head* somewhat coppery, densely punctured, with a slight concavity in front: *eyes* elongated, olivaceous: *thorax* densely punctured, subdilated, with two transverse impressions more or less conspicuous on each side the middle; margin rounded, lateral submargin with a concavity behind near the posterior angles; posterior margin with a narrow, smooth, highly polished border; lateral margin rounded: *scutel* subtriangular: *elytra* densely punctured, apparently granulated, more or less concave before and behind the middle: body *beneath* black, punctured, towards the apex blackish green, highly polished: *legs* black.

Var. *α*. Thoracic transverse depressions, as well as those on the elytra, nearly obsolete.

Length between four twentieths and five twentieths of an inch.

Several specimens occurred about the middle of June near Moosehead Lake, on the blossoms of *Ranúnculus* *acris.* It is the counterpart of the B. *4-punctata* of Europe, but is smaller.

5. ELATER ANCHORAGO.

E. corpore attenuato; antennis pectinatis; thorace cupreo, profundè canaliculato; elytris pallidis, posticè maculo lanceolato, submarginato, purpureo.

Body attenuated, palpi blackish: *antennæ* black or purplish black, strongly pectinated: *head* and *thorax* coppery, deeply punctured, the latter not dilated; convex on each side of the median furrow, which is deeply impressed; base hairy; margin slightly curved; posterior angles very acute: *scutel* darker than the *elytra* which are testaceous, deeply punctured, with moderately impressed striæ; punctures of the striæ darker than on the intermediate spaces; apex rather acute, with a dark purplish, narrow spot, extending from the tip almost to the middle of the outer margin: *legs* coppery, rather hairy: *feet* somewhat piceous: *pectus* and *abdomen* metallic, densely and profoundly punctured.

Length from five tenths to six tenths of an inch.

Several specimens occurred early in June, on the bald summit of the Blue Mountains. It is readily distinguished by its pectinated antennæ, and is the counterpart of the E. *signàtus* of Europe.

6. ELATER APPROPINQUANS.

E. corpore dilatato, infra nigro; antennis serratis; thorace nigro, nitido, punctulato, margine curvato, angulis posticis acutis; scutello nigro, ovato; elytris viridibus, nitidis, striis punctulatis.

Body broad: *head* black, polished, deeply punctured: *antennæ* serrate; joints beyond the third, somewhat cordate: *palpi* black: *thorax* convex, much dilated, punctured, with a transverse, indented line on each side of the base; median line slightly impressed; margin considerably rounded; posterior angles acute: *elytra* broadest below the middle, dark green, polished, with punctured striæ; interstitial spaces somewhat granulated, especially towards the base; apex rather obtuse: *legs* black: *tarsi* dilated, beneath somewhat fuscous: body *beneath* entirely black, polished, punctured.

Length more than eleven twentieths of an inch.

Probably referable to the genus Ludius of Latreille.

It is the counterpart of the E. *æneus* of Europe. It is closely allied to the *metállicus* (Harris Cat.) and especially to a large species yet undescribed in the cabinet of the Society.

7. ELATER RUFIFRONS.

E. lateribus parallelis; clypeo rufo, supra excavato; palpis et pedibus rufis; antennis rufis, leviter serratis; thorace nigro, latè rufo-marginato; elytris subfuscis, vitta media et subflava, lata.

Body with its sides nearly parallel: *palpi* rufous: *antennæ* rufous; joints very slightly serrate, becoming gradually more cylindrical toward the extremity; last joint somewhat acute; *clypeus* greatly projecting, ridge somewhat elevated, leaving a deep concavity superiorly: *thorax* nearly quadrate, deeply punctured, with hardly any trace of a median furrow; posterior angles blunt, not directed outwards; color on each side bright rufous, leaving a broad black centre, which, abruptly narrowing anteriorly, is connected with a black band running from eye to eye: *elytra* striate, punctured, brownish, each with a broad yellowish vitta, passing from the base to the apex, which is much rounded: *eyes* black: body *beneath* piceous, profoundly punctured; a somewhat triangular space of a deeper piceous extends from the eyes to the sternum.

Length about six tenths of an inch.

Inhabits Hallowell, Me.; rare.

The projection of the clypeus in this species would seem to refer it to the genus Campylus of Fischer, but it wants the prominent eyes and strangulated neck of that genus.

8. ELATER ÆRARIUS.

E. corpore subattenuato, viridi-cupreo, nitido; antennis serratis; thorace supra leviter inflato, utrinque ante basin puncto impresso, angulis posticis acutis; elytris leviter rugosis, striatis, punctis subtiliter impressis.

Body somewhat attenuated: *head* green or coppery, somewhat semicircularly indented, deeply punctured: *eyes*, *palpi* and *antennæ* blackish; the latter serrate: *thorax* not dilated, polished green, varied with coppery; rather convex above, and having an indented transverse line on each side at base; median line impressed, slightly above, more deeply at base; margin very slightly curved; posterior angles decidedly acute; a little above the base on each side, is an impressed puncture more or less conspicuous: *scutel* ovate: *elytra* brilliant polished green, more or less coppery, deeply striate; striæ indistinctly and minutely punctured; interstitial spaces convex, finely granulated; apex rather acute: body *beneath* coppery: *feet* somewhat dusky.

Length little more than five tenths of an inch.

Of 110 native species of this genus contained in my collection, this is by far the most brilliant in its coloring. A specimen occurred in Cambridge, Mass., June, 1831, and several others in Maine, June, 1836, in the vicinity of the Saddleback Mountains, and northern part of the Umbagog chain of Lakes.

9. ELATER PRODUCTUS.

♂ E. antennis profundè serratis; clypeo valdè prominente; thorace quadrato, hirsuto, punctulato; angulis posticis rufis, subrectis, leviter reflexis; elytris piceis, subæratis, profundè striatis, et punctulatis. ♀ Thorace valde convexo rufo, aut fusco marginato, angulis posticis dilatatis, antennis simplicibus.

♂ *Head* deeply punctured, hairy: *clypeus* projecting: *antennæ* robust, deeply, and somewhat obliquely serrated on one side: *thorax* nearly quadrate, deeply punctured, hairy, posterior angles reddish brown, almost rectilinear, somewhat reflexed, excavated on the inner side, considerably rounded: *scutel* subrotund: *elytra* pitchy, somewhat bronzed, deeply striate, universally and deeply punctured, so as to appear granulated: body *beneath* black, punctured, with short grayish hairs: *feet* piceous.

♀ Differs from the male, by its greater size, more dilated form, its very convex thorax margined with reddish brown, its less prominent eyes, and especially by its simple, though robust antennæ.

♂ Length twelve twentieths of an inch. Breadth of thorax about two twentieths. ♀ Length rather above fourteen twentieths of an inch. Breadth of thorax nearly three twentieths of an inch.

Both sexes of this insect occurred June 1836, at the foot of Mount Abraham. It must be referred to the genus Campylus of Fischer.

10. ELATER HONESTUS.

E. corpore sub-attenuato, capite nigro, profundè punctulato; antennis serratis, piceis; thorace nigro, sub-elongato, anticè angustato, medio obsoletè canaliculato; basi utrinque transversè striata, angulis posticis acutis; elytris fusco-testaceis, obsoletè striatis, punctulatis, post medium sericiis; pedibus piceis.

Body elongated, somewhat broad, attenuated towards the apex: *head* black, deeply punctured: *palpi and antennæ* piceous, the latter serrate: *thorax* black, somewhat convex, rather elongated; furrow in the middle obsolete or lightly impressed: base on each side transversely indented; centre lightly, sides deeply punctured; margin gently curved, posterior angles acute, directed very little outwards: *scutel* oval, darker than the elytra: *elytra* brownish testaceous, obsoletely striate, universally and moderately punctured, sericeous behind the middle: apex obtuse; body *beneath* black, punctured: *legs* entirely piceous.

Length from less than nine twentieths to more than eleven twentieths of an inch.

Several specimens occurred in June, on, and in the vicinity of the Blue Mountains.

11. ELATER BASALIS.

E. corpore sub-dilatato; capite nigro; antennis serratis, rufo-piceis; thorace nigro, punctulato, angulis anticis capite non latioribus, posticis sub-acutis, scutello ovato, nigro; elytris striatis, punctulatis, basi rufo-sanguineis.

Body somewhat dilated: *head* black: *antennæ* light piceous: sub-convex, broadest at base, punctured, a little hairy, without any median furrow; margin gradually curved toward the anterior angles, which are no wider than the head; posterior angles sub-acute and nearly straight: *scutel* ovate, black, striate, punctured: *elytra*, sub-basal and humeral regions rufo-sanguineous: body *beneath* black, punctured: *feet* piceous.

Length from three tenths to four tenths of an inch.

Appears allied to the *bimaculàtus* of Europe, and to the *geminàtus* of Say. Not very frequent.

12. ELATER SEMI-CINCTUS.

E. corpore sub-dilatato, sericeo; antennis serratis; thorace nigro, sub-convexo, punctulato, leviter ad basim impresso, angulis posticis sub-acutis; scutello nigro; elytris nigris, striatis, punctulatis, basi margineque superiori sanguineis; apice obtuso.

Body considerably dilated: *antennæ* black, third joint much smaller than the fourth: *head* and *thorax* black, punctured, polished; the latter somewhat convex, gradually narrowing before, somewhat sericeous, median furrow obsolete or indented at base; posterior angles sub-acute, nearly in a line with the margin, and sometimes terminated by a bristle: *scutel* black: *elytra* black, with deeply punctured striæ; interstitial spaces only slightly convex, deeply punctured; base with a sanguineous band, curving over the humerus, and passing a little downwards upon the margin; apex rather obtuse: body *beneath* black, punctured: *feet* somewhat piceous.

Length rather more than nine twentieths of an inch; rare.

It seems most nearly allied to the *E. discoideus* of Fabr.

13. ELATER APPRESSUS.

E. corpore sub-dilatato, brevi; capite punctulato; antennis serratis, articulis sub-compressis; thorace brevi, nigro, latere margineque antico rufo-sanguineis; scutello ovato; elytris pallidis, striatis, punctulatis. utrinque, maculis tribus nigris, interruptis; sutura nigra.

Body dilated, rather short and thick: *head* black, punctured, *antennæ* black, serrated, joints considerably flattened; *thorax* gently curved upon the sides, a little narrowing before, minutely punctured, margined anteriorly and laterally with reddish sanguineous; posterior angles sub-acute, directed only slightly outwards; posterior margin somewhat curved to admit the bases of the elytra, to which it is rather closely pressed: *scutel* ovate, black; *elytra* yellowish, testaceous, moderately striated and punctured, and marked with three irregular interrupted, blackish spots, one extending from the humerus downwards and somewhat inwards, one on the middle somewhat fasciate, and one below the middle; suture black; apex moderately acute: *thighs* blackish: *tibiæ* and *tarsi* subfuscous.

Length about four tenths of an inch.

Seems allied to the E. *hieroglyphicus*, (H. Cat.)

The intervals between the elytral spots in my specimen, being a little darker, seems to indicate that they may be sometimes all connected in one longitudinal vitta.

14. ELATER FILIUS.

E. corpore nigro, elongato; antennis serratis; thorace subtilissimè punctulato, longitudine dimidio latitudinem excedente, basi utrinque impressa, marginbus propè parallelis, angulis posticis obtusis. Elytris striatis, subtilissimè punctulatis, et rugosis: pedibus piceis.

Body black, elongated: *antennæ* serrate: *thorax* almost imperceptibly punctured, length one half greater than the breadth; middle with no furrow; base with an impression on each side; margins nearly parallel; posterior angles moderately elongated, obtuse at the extremity: *elytra* striate, punctures of the striæ almost imperceptible, as well as the rugosity of the intermediate spaces: *feet* light piceous.

Length little more than three tenths of an inch.

Occurred in June on the Saddleback Mountains.

15. ELATER TRI-UNDULATUS.

E. capite nigro, punctulato; antennis leviter serratis; thorace subovato, leviter punctulato, non canaliculato; angulis posticis sub-acutis. Elytris flavo-fuscis, sericeis, fasciis tribus ferrugineis angulariter undulatis; pedibus piceis.

Head black, punctured: *antennæ* rather slightly serrate, elongated; joints rather stout and somewhat ciliate: *thorax* sub-oval, rather hairy, median furrow none; surface minutely punctured; posterior angles short, subacute: *scutel* depressed, circular: *elytra* yellowish brown, somewhat pruinosely sericeous, dilated below the middle, each with three ferruginous transverse fasciæ, forming an obtuse angle on each elytron, except the lower one, which is simply undulating; apex obtuse: body *beneath* black, sericeous, finely punctured: *legs* somewhat piceous: *tarsi* rather lighter.

Length three tenths of an inch.

Occurred near Moosehead Lake, middle of June, and is readily distinguished by its angularly trifasciate elytra.

16. Elater macilentus.

E. corpore angustato, subtus rufo-piceo; antennis nigro-piceis, villosis, capite densè punctulato; thorace sub-depresso, sub-elongato, marginibus subrectis, angulis posticis acutis; elytris sub-fuscis, leviter striatis, et punctulatis; pedibus rufo-piceis.

Body slender, beneath reddish piceous, especially on the breast: *antennæ* blackish piceous, hairy, third and fourth joints subequal: *head* densely punctured: *thorax* inconspicuously punctured, somewhat flattened, with very short hairs; length one half greater than breadth; margins nearly straight; posterior angles acute: *scutel* ovate, darker than the *elytra*, which are light brownish, universally and minutely punctured; striæ shallow: *feet* reddish piceous.

Length more than seven twentieths of an inch.

Inhabits Blue Mountains, June.

17. Elater graciliformis.

E. corpore, sub-cylindrico; capite atro, punctulato, fronte impresso; antennis serratis, testaceis; thorace convexo, nigro, anticè sub-testaceo, valde polito, angulis posticis acutis, piceis; elytris piceo-nigris, striatis, apice obtuso; pedibus testaceis.

Body narrow, somewhat cylindrical: *head* black, with small punctures; front somewhat semi-circularly indented: *antennæ* testaceous, serrate; third joint very little smaller than the following, and twice as large as the second: *thorax* convex, black, anteriorly a little testaceous, very much polished, longer than broad, with a slight excavation before the posterior angles; punctures few and small, not apparent through a common glass; margin very slightly curved; posterior angles, piceous, acute;

elytra pitchy black; striæ rather shallow, punctured; apex obtuse: *feet* pale testaceous.

Length between sixth twentieths and seven twentieths of an inch.

18. ELATER TENUICOLLIS.

E. *graciliformi* similis, sed corpore multo minore, graciliori; thorace penitus atro, minus convexo, margine vix curvato; antennis nigris; elytris pallidis, testaceis; pedibus piceis.

Nearly allied to *E. gracilifórmis* described above; but the *body* is at least one half smaller, more slender: *thorax* less convex, entirely black; margin nearly straight: the *antennæ* are almost black: the *elytra* pale testaceous, and the *feet* piceous.

Length nearly five twentieths of an inch.

Not so rare as the above. I have found it both in Maine and Massachusetts.

19. OMALISUS THORACICUS.

O. corpore nigro; humeris rufo-sanguineis; thorace anticé subquadrato. Angulis posticis prominentibus et sub-transversis, rhombo centrali elevato; elytris lineis quinque carinatis, cum carinulis intermediis; spatiis mediis valdè rugosis.

Body elongated, black, with bright rufous shoulders: joints of the *antennæ* rather more cylindrical than compressed: *labrum* somewhat rufous at tip: *thorax* quadrate anteriorly; posterior angles prominent, somewhat transverse; middle with a much elevated rhomboidal ridge, winged laterally, and dividing the surface into five profound cavities; margin elevated: *elytra* each with five distinct, elevated lines, and three or four indistinct, intermediate ones; the second distinct line becomes obsolete before reaching the tip; intermediate spaces profoundly rugose.

Length between three tenths and four tenths of an inch.

Inhabits Saddleback Mountains, June.

By its rufous humeral spot, it resembles the *humeràlis*, Fabr. (see H. Cat.)

20. OMALISUS CRUCIATUS.

O. corpore nigro; labro piceo; antennis sub-compressis; thorace penitus luteo marginato, septo sub-cruciato quadripartito, marginibus elevatis; elytris sex-carinatis, spatiis mediis valdè rugosis.

Body black: *labrum* piceous at tip: *antennæ* somewhat compressed: *thorax* black, broadly margined on all sides with yellowish, except at base, where the margin is narrow; lateral and anterior margins elevated; a cruciate septum of which the transverse portion is less conspicuous upon the middle, divides the surface into four parts; anterior angles broadly rounded, posterior somewhat acute, turning a little outwards, each with six distinctly elevated lines, whose intermediate spaces are very rugose.

Length between three tenths and four tenths of an inch.

Inhabits Saddleback Mountains, June.

21. OMALISUS FRATERNUS.

O. *cruciato* similis, sed sic distinguendus; thorace luteo, penitus nigro marginato, septo transverso prope obsoleto.

Allied to O. *cruciàtus* described above, but differs chiefly by its thorax, which is yellow, margined with black; transverse septum nearly obsolete.

22. LAMPYRIS BOREALIS.

L. corpore elongato, fusco aut sub-nigro; thorace roseo, in medio carinato; margine fusco, antice leviter depresso, maculâ centrali sub-nigrâ, elongatâ, postice transversâ; scutello nigro. Elytris obtusé et obliqué carinatis, suturâ margineque valde angusto, testaceis; subtùs apice maculis albis bigeminatis; pedibus nigris.

Body elongated, rather broad, brownish black: *head* very much retracted: *thorax* rosaceous, carinated in the middle; centre with a broad blackish spot, transverse behind, gradually narrowing and growing paler before, and extending to the tip; a tubercle more or less distinct on each side, above the transverse portion; base transversely canaliculate, channel sometimes interrupted by the longitudinal carina: *scutel* black, somewhat triangularly oval: *elytra* brownish black, with obtuse and somewhat oblique elevated lines, becoming gradually obsolete downwards; suture and margin narrowly bordered with testaceous: *abdomen* beneath, near the tip, with bigeminate, white spots: *legs* black.

Length from more than five tenths to six tenths of an inch.

It occurred now and then, but not frequently, in the vicinity of Augusta.

A rather large species. It is closely allied to the L. *angulàta* of Say, but is much larger and otherwise sufficiently distinct.

23. MALACHIUS CÆRULEUS.

M. capite nigro, polito, labro testaceo, anticè maculâ nigra; antennis nigris; thorace elytrisque cæruleis, tibiis quatuor anticis testaceis, duobus posticis nigris.

Head black, polished: *labrum* testaceous, with a black spot before: *antennæ* black, base piceous underneath: *thorax* and *elytra* blue: four anterior *tibiæ* testaceous, two posterior black.

Length more than one tenth of an inch.

Inhabits Hallowell, May.

Closely allied to the M. *flavilàbris* of Say.

24. PELTIS FRATERNUS.

P. corpore dilatato, penitus ferrugineo, supra valdè punctulato; scutello transverso; elytris canaliculatis, canaliculis serie duplici punctatis, lateribus obliquè contractis, margine recurvato.

Body dilated, wholly ferruginous, punctured above: *scutel* transverse: *elytra* broadly channeled, with a double series of impressed punctures on each, somewhat laterally arranged; channels obsolete toward the margin, which is considerably recurved; intermediate spaces smooth; sides only obliquely contracted.

Length from eight twentieths to more than nine twentieths of an inch.

Lives under the bark of trees.

Allied to the *ferrugínea* of Europe, but is larger, rather more depressed, rather less abruptly contracted at the sides, and far more distinctly punctured.

25. PELTIS SEPTENTRIONALIS.

P. corpore penitùs rufo, supra punctulato; scutello transverso; elytris canaliculatis, punctulatis, punctis transversis, in ordinibus singulis impressis, lateribus abruptè contractis.

Body entirely rufous, punctured above: *scutel* transverse: *elytra* channeled, with a single series of transverse punctures in each channel; sides very abruptly contracted, almost at right angles with the margin, which is almost level or slightly recurved.

Length about six twentieths of an inch.

Nearly allied to the above, but sufficiently distinct, no less by its size, than by its single rows of punctures.

26. NITIDULA TRUNCATA.

N. corpore depresso; capite nigro; antennis piceis; thorace nigro aut fusco; elytris fusco-testaceis, posticè abruptè truncatis, angulis posticis interdùm nigris.

Body very flat: *head* black: *antennæ* piceous; club elongate, pyriform: *thorax* blackish or brownish: *elytra* brownish, sometimes testaceous, nearly quadrate, on account of their being abruptly truncated behind throughout their whole width, leaving nearly one half the abdomen exposed; posterior angles generally blackish: *feet* piceous.

Length considerably less than one tenth of an inch.

Occurred abundantly in the spring, upon the sap of prostrate trees of the sugar maple (*Acer saccharinum*).

Probably referable to the genus Cercus, and seems to be closely allied to the *Cercus niger* of Say.

27. NITIDULA AVARA.

N. corpore sub-elongato, sub-depresso, duplo longiore quam lato, marginibus sub-parallelis, fusco-fulvo; margine thoracis curvato, angulis posticis sub-acutis; elytris sub-planis, singulis ad apicem rotundatis, nigro-bimaculatis.

Body somewhat elongated, rather depressed, margins somewhat parallel, and a little dilated; color entirely brownish yellow: club of the *antennæ* rather stout:

margin of the *thorax* curved, posterior angles turning a little inwards, and very slightly acute: *elytra* smoothish, each with two black spots placed obliquely in relation to each other; apex rounded in each, so as to leave a notch at the suture.

Length three twentieths of an inch.

Bears a close resemblance to the genus Ips, in the shape of the body.

Occurred in similar situations with the above.

28. IPS SEPULCRALIS.

I. corpore elongato; capite nigro, levitèr punctulato, lateribus sub parallelis, antennis paululùm lanatis; thorace levitèr punctulato, subquadrato; coleoptris punctulatis, maculis decem albis elongatis 2, 4, 4, positis.

Body much elongated, black, a little piceous; sides parallel: *head* minutely punctured: *antennæ* piceous, club black and somewhat woolly: *thorax* minutely punctured, sub-quadrate: *coleoptra* rather strongly punctured, and marked with ten narrow, elongated white spots, placed 2 on the upper margin, 4 above the middle, lateral ones indistinct, becoming lost in the margin, and 4 behind the middle, lateral ones a little superior to the others; apex obliquely sub-truncated.

Length somewhat more than two tenths of an inch.

It occurred in April, with many other species of its tribe, about the trunks of newly cut sugar maple (*Acer saccharinum*).

29. HYDROPHILUS AGILIS.

H. capite nigro, punctulato, thorace nigro, léviter punctulato, margine pallido; scutello nigro; elytris griseis, nigro-maculatis et subtilissimè punctulatis; apice pedibusque testaceis.

Head black, slightly punctured: *thorax* black, with very small punctures; margin pale: *scutel* black: *elytra* minutely punctured, gray, with several black spots: *apex* and *feet* testaceous. In some lights, through a strong magnifier, the elytra appear striated with numerous cinereous lines, interspersed with a few spots of the same color.

Length from less than one tenth to little more than one tenth of an inch.

Stagnant waters, Hallowell.

30. APHODIUS NODIFRONS.

A. corpore supra rotundato; clypeo transversè carinato; capite nigro, tri-tuberculato; antennis rufis aut rufo-fuscis; thorace nigro, anticè (in maribus) profundè excavato, margine anticè rufo; elytris rufo-sanguineis, striatis, striis punctulatis.

Body much rounded above: *clypeus* transversely carinated: *head* with three tubercles: *antennæ* rufous or reddish brown: *thorax* black, with a profund excavation anteriorly, in the males; a large rufous spot on the anterior margin: *elytra* bright reddish, with regularly punctured striæ.

Length from three tenths to nearly four tenths of an inch.

This insect is the counterpart of the A. *fimetàrius* of Europe, and is extremely abundant throughout all Maine. I have not met with it elsewhere.

31. TENEBRIO (Upis) CÆRULEUS.*

T. corpore penitùs sub-cæruleo et punctulato: thorace canaliculato, lateribus anticè sub-rotundatis, posticè multum contractis; elytris nigro-cæruleis, profundè penitùsque punctulatis; singulis, lineis quinque distantibus, parum elevatis.

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* See end of Article I.

Body somewhat cylindrical, entirely blue, or blackish blue, and punctured: ***front*** flattened: ***antennæ***, second joint one half the size of the third, last elongated: ***thorax*** more polished, less punctured and much narrower than the elytra, somewhat cylindrical, canaliculate in the middle; before, broadly rounded; behind, a good deal contracted: ***elytra*** somewhat rounded, so densely punctured as to appear granulated, with five equidistant, rather broad, and not much elevated lines; apex obtuse.

Length about seven tenths of an inch.

Occurred June, 1835, at Hallowell, on a log in the Kennebec river. It is a remarkable insect, easily identified.

32. ELEDONA DEPRESSA.

E. corpore nigro, sub-lævi, subtus piceo; antennis piceis; thorace sub-depresso, granulato, margine sub-dilatato: elytris parum convexis, singulis decem-carinatis; spatiis mediis rugosis aut transversè punctulatis; apice subrotundato; pedibus piceis.

Body black, somewhat smooth, beneath piceous: ***head*** finely granulated, with an almost obsolete line between the eyes: *antennæ* piceous: *thorax* somewhat depressed, finely granulated; margin somewhat dilated, not greatly projecting anteriorly: *elytra* only slightly convex, with ten elevated lines on each, including the marginal one; intermediate spaces rugose, owing to transverse punctures; apex rounded: ***body beneath***, and ***feet*** ferrugineo-piceous.

Length one fifth of an inch.

Occurred at Hallowell, April, under the bark of prostrate pine logs.

The smallest species that I have seen, unlike the E. ***cornùta*** F. and E. *corticola*, Say. This species is without tubercles, and is of a narrower and more depressed form.

33. DIRCÆA DECOLORATA.

D. corpore elongato; capite thoraceque nigris et punctulatis; elytris leviter punctulatis, sericeis, nigris, basi piceis aut rufo-piceis; pedibus piceis.

Body elongated, head much depressed: *front* flattened, minutely punctured: *palpi* testaceous, last joint of the maxillary ones somewhat short, tri-angular: *thorax* black, finely punctured, about as broad as long, a good deal lowered upon the sides, before: *elytra* finely punctured, black, basal half more or less piceous or rufo-piceous: *feet* piceous.

Length from two tenths to three tenths of an inch.

Not very infrequent in the mountainous parts of Maine.

Nearly allied to an apparently undescribed species from New Hampshire, which has the body wholly black, and rather less elongated than in the present.

34. DYTILUS MONILICORNIS.

D. corpore piceo-nigro, densè et profundè punctulato; fronte deprèssâ, transversè carinatà; antennis brevibus, sub-moniliformibus, ante oculos longo intervallo insertis; thorace brevi, sub-cordato; elytris profundè punctulatis; margine sub-reflexo, apice obtuso; pedibus piceis.

Body horny, pitchy black, densely and profoundly punctured: *front* depressed, transverse ridge very distinct: *mandibles* reddish piceous, darker at tip: *antennæ* short, inserted a good deal before the eyes, nearly moniliform: *thorax* short, somewhat cordate; margin a good deal rounded, considerably contracting towards the base:

elytra universally and profoundly punctured; margin a little reflexed ; apex obtuse ; *legs* reddish-piceous: *thighs* nearly equal: *tarsi* slender, penultimate joint not bi-lobate.

Length less than four tenths of an inch.

A remarkable species and recedes from the Œdemerites in the form of the penultimate tarsal joint which is not bi-lobate. In the position of the antennæ, it nearest approaches Dytilus, and should perhaps be placed in a genus by itself, as the connecting link between Dytilus and Œdemera.

35. PYROCHROA INORNATA.

P. corpore nigro, sub-villoso; capite nitido, articulis duobus primis antennarum piceis; thorace nitido, rotundato; elytris punctulatis.

Body entirely black, wholly covered with short, cinereous hair: *head* polished: first two joints of the *antennæ* piceous: *thorax* polished, nearly round, somewhat convex: *elytra* deeply punctured.

Length from four twentieths to six twentieths of an inch.

Occurs in various parts of Maine, chiefly in mountainous regions.

36. RHYNCHITES VIRIDI-ÆNEUS.

R. corpore elongato viridi-æneo; capite sub-nigro, densé punctulato; rostro dilatato, supra utrinque sulcato; thorace æneo, densè et profundè punctulato; elytris viridi-æneis, seriebus vagis punctulatis; pedibus piceis.

Body elongated, brassy: *head* darker, profoundly punctured: *front* somewhat depressed: *rostrum* dilated, especially at tip which presents a tubercle on each side; an impressed line nearly the whole length on each side:

thorax brassy, densely and profoundly punctured: *elytra* greenish brassy, with profound punctures, disposed in irregular lines; *feet* inclining to piceous.

Length about three twentieths of an inch.

Occurred at Augusta, June.

Perhaps allied to the R. *æràtus* of Say; but the elytra of that insect are described as "crenato-striate."

37. PISSODES AFFINIS.

P. corpore piceo, villis luteis asperso; thorace obsoletè luteo-bi-maculato; elytris punctulatis, singulis decem-costatis; striis cirris ferrugineis fasciculatis, guttâ parvâ luteâ ante, et post medium maculâ magnâ transversâ.

Body dark pitchy, slightly ferruginous, and besprinkled with short yellow hairs: *thorax* with two very minute yellow spots: *scutel* yellow: *elytra* each with about ten equally elevated lines; striæ with tufts of short, dark ferruginous hair, a small round yellow spot before, and a large transverse one, composed of short yellow hair, and interrupted by the elytral striæ, behind the middle.

Length less than four tenths of an inch.

Pine woods, Maine, rare.

Two specimens formerly occurred in the vicinity of Boston. It is closely allied to the P. *strobi*, Peck, (P. *nemoràlis*, Germ. et Schœn.) but the spots are yellow instead of white, and it has not two brown spots on each elytron, like that insect. It is more hairy, and the elytral ribs are more equally elevated.

38. PISSODES DUBIUS.

P. *affini* similis, sed certè duplo minor; maculis cinereis, minutis, propè obsoletis; corpore leviter pruinoso.

Nearly allied to the P. *affinis* described above, but is less than half as large. The spots are cinereous, instead of yellow, and the body, owing to the distribution and color of the hairs, is of a more pruinose aspect.

Length from two tenths to nearly three tenths of an inch.

In similar situations with the above. Several specimens also occurred upon a wharf in Boston, during the year 1831, upon pine wood, brought from Maine.

39. TOMICUS GULOSUS.

T. corpore brevi, sub-cylindrico, subtus nigro; antennis fulvis; thorace sub-globoso, granulato; elytris testaceis, leviter striatis, striis punctulatis, apice uni-sulcatis, interdum bi-sulcatis, margine suturâque nigris, apice integro.

Body short, thick, cylindrical, beneath black; *labrum* polished: *antennæ* fulvous: *thorax* sub-globose, densely and minutely granulated: *elytra* slightly striated: striæ punctured; above the apex, near, and parallel to the suture is a sulcus, and sometimes near it an additional one; color testaceous; margin on each side of suture, black; apex entire: *legs* black.

Length not three twentieths of an inch.

Occurred plentifully in Hallowell, about the sap of newly cut maple trees (*Acer saccharinum*), April.

40. TOMICUS THORACICUS.

T. corpore cylindrico, nigro; antennis nigro-piceis; thorace sub-globoso, indistinctè punctulato; elytris punctulatis, vix striatis, apice integro.

Body cylindrical, a little rough, black: *antennæ* pitchy black: *thorax* sub-globose, indistinctly punctured: *elytra* punctured, hardly striate, although in some lights the distribution of the punctures gives somewhat that appearance; apex entire.

Length three twentieths of an inch.

Occurred in similar situations, with the above.

Perhaps referable to the genus Apate of Fabricius.

41. TRIPHYLLUS RUGOSUS.

T. corpore fusco, sub-cylindrico, rugoso; antennis piceis; thorace obsoletè canaliculato, utrinque tuberculis paucis leviter elevatis; elytris obtusè costatis, costis ad medium obsoletis, pedibus piceis.

Body dark brownish, very rough, somewhat cylindrical: *antennæ* piceous: *thorax* obsoletely channeled, with a few slightly elevated tubercles on each side; margin very slightly reflected: *elytra* obtusely ribbed, ribs toward the middle obsolete; *feet* piceous.

Length more than three twentieths of an inch.

The T. *punctàtus* Fabr. of Europe, is the only species that I have seen, to which, however, the present insect bears very little resemblance.

42. LAMIA MARMORATA.

L. corpore piceo, maculis albis et fulvo-ferrugineis variegato; labro piceo; antennis piceis; fronte canaliculatâ; thorace uni-spinoso; elytris marmoratis et alternatim sub-fasciatis; apice sub-acuto; pedibus fulvo-villosis.

Body hairy, hairs disposed for the most part in tufts, denuded spaces pitchy brown: *head* in front canaliculate: *labrum* piceous: *antennæ* piceous, union of the joints darker; first joint dusky, somewhat hairy: *thorax* with a few scattered tufts of rusty yellow hair; a single spine on each side; *scutel* yellowish-ferruginous, hairy: *elytra* marmorated with naked spaces, and white and yellowish-ferruginous patches of hair, disposed somewhat alternately and obliquely, so as to present an interruptedly fasciate appearance; apex somewhat acute: body *beneath* yellowish-ferruginous, hairy; *thighs* dusky, somewhat yellowish pilose: *tibiæ* inclining to piceous.

Length one inch.

A large and handsome species—rare.

43. CALLIDIUM OBSOLETUM.

C. corpore penitus fusco; thorace sub-rotundato, foveis obsoletis; scutello sub-truncato; elytris punctulatis, singulatim bi-carinatis.

Body wholly brown or dark cinnamon color: *front* with a longitudinal sulcus: *thorax* nearly round, with an obsolete sulcus, in the middle; thoracic impressions nearly obsolete: *scutel* a little truncated behind: *elytra* each with two distinct elevated lines.

Length nearly eight tenths of an inch.

Closely allied to the C. *juvéncum*, H. Cat., but is much larger; also to the C. *foveicólle*, Dej. Cat., but besides being much smaller and always lighter colored, differs by its thoracic impressions, which in that insect, are very profound.

44. LEPTURA MONTICOLA.

L. corpore brevi, sub-crasso, luteo-sericeo; antennis pedibusque nigro-piceis; capite thoraceque luteo-pubescentibus; thorace ovato; coleoptris luteis, maculis decem nigris,—4 minoribus 2, 2, 2, positis.

Body rather short and thick, tapering at both ends: *antennæ* blackish piceous: *head* and *thorax* black, appearing yellow with golden pubescence; the latter ovate: *elytra* yellowish, each with five black spots placed, two very small above the middle, one large just below the middle, one above the apex, and one at apex, which is almost imperceptibly truncated: *legs* colored like the antennæ: body *beneath* with very pale, hardly golden pubescence.

Length from seven twentieths to more than nine twentieths of an inch.

Var. α. two anterior spots, blending with the one next below.

Var. β. inner anterior spots elongated downwards.

The above are the most conspicuous varieties in my possession.

Occurred abundantly in June, on the Saddleback Mountains, and in the vicinity of the Moosehead Lake.

Allied to the L. *velutina*, Oliv. and to several other species both of Europe and America.

45. LEPTURA PLEBEJA.

L. corpore sub-convexo, vix attenuato, subtus nigro; capite punctulato, nigro; antennis pedibusque nigris; thorace nigro, elongato-ovato, anticè abruptè contracto; elytris sub-convexis, leviter attenuatis, fusco-testaceis; apice obliquè emarginato, interdum sub-obscuro.

Body sub-cylindric, punctured, beneath black; *head* antennæ, and feet black: *eyes* very little prominent: *thorax* black, elongate-ovate, rather suddenly contracted anteriorly: *elytra* rather convex, only a little attenuated towards the extremities, muddy-testaceous, becoming usually a little darker at tip, where the inner margins slightly divaricate; apex obliquely notched.

Length from five tenths to six tenths of an inch.

Inhabits Hallowell and Augusta, July.

Closely allied to the L. *próxima* of Say, but is narrower, rather more cylindric, the apex notched, and more obliquely truncated.

46. LEPTURA VITTIGERA.

L. corpore nigro, elongato: apice attenuato, subtùs aureo-sericeo; capite thorace latiori; antennis longis; thorace elongato, pubescente, supra canaliculato, tuberculis lateralibus propè obsoletis; elytris punctulatis, singulis vittâ testaceâ, vittis anticè sub-divaricatis, apice obliquè truncato; pedibus sericeis.

Body black, elongated, attenuated toward the apex; beneath pale, somewhat golden sericeous: *head* broader than the anterior portion of the thorax, transversely and longitudinally somewhat indented: *eyes* prominent: *antennæ* elongated, somewhat sericeous: *thorax* elongated, pubescent, somewhat cylindrical, being only a little broader in the middle, on account of the depression of the lateral tubercles; a little flattened behind, and a good deal before; above with a longitudinal sulcus: *elytra* each with a broad whitish vitta, extending from the humerus almost to the apex, which is obliquely truncated; the vittæ are somewhat divergent anteriorly: *feet* dusky.

Length nearly seven tenths of an inch.

A fine species and occurred in June, on the blossoms of *Sambùcus pubèscens*, at the foot of Mount Bigelow, near the margin of the Dead River.

Very nearly allied to a species in the collection of Mr. Say: but the ground color of the elytra in that insect, is reddish instead of black. The vittæ are a good deal broader, and the lateral tubercles of the thorax very much more prominent.

47. LEPTURA SEMI-MARGINATA.

L. corpore brevi, punctulato, subtùs griseo-sericeo; capite, antennis, pedibusque nigris; thorace brevi, sub-ovato, antice abruptè contracto; tuberculis lateralibus nullis; elytris fusco-testaceis, vix attenuatis, vittâ abbreviata marginali nigrâ; apice truncato, obtusè sub-spinoso.

Body short, rather broad at humerus, punctured; beneath somewhat grayish-sericeous; *head, antennæ, palpi* and *feet* dusky black: *thorax* short ovate, abruptly contracted before; margin without tubercles: *elytra* muddy-testaceous, hardly attenuated; margin with a black vitta, extending half way toward the apex, which is truncated, terminating in a very short, blunt spine, on the inner side.

Length hardly three tenths of an inch.

Occurred in the town of Abbott, between the Kennebec river and Penobscot county.

48. CASSIDA HELIANTHI.

C. corpore ovato; antennis nigris, basi testaceis. Thorace testaceo, maculis tribus nigris; elytris nigris, vage punctulatis, maculis albis irroratis, margine testaceo; corpore subtus atro, nitido; femoribus testaceis, ad medium nigris; tibiis pedibusque testaceis.

Body obovate: *antennæ* with the terminal joints black, the middle ones black above, paler beneath, and the basal ones whitish; region about the basal joints of the same color, as well as that about the eyes, which are black: *labrum* black: *thorax* testaceous, with three strongly marked black spots, disposed nearly in a curved line above the base: *scutel* equilaterally triangular: *elytra* blackish, irregularly spotted with white; a spot on each elytron above the middle and near the suture, usually the largest; margin testaceous, broadest above, and bounded on the inner side by an impressed stria: *underneath* black, polished: *thighs* white, black in the middle: *tibiæ* and *feet* testaceous.

Length two fifths, breadth one fourth of an inch.

After death, the body in general loses its color, becoming nearly of a palė testaceous, except the three black spots on the thorax, which are increased in distinctness. This insect is so nearly allied to the C. *unipunctàta* of Say, that from an inspection of the mutilated remains of that species, in his cabinet, it would seem to be only a variety; but the three black spots on the thorax of the present species, apparently a constant character, may serve sufficiently to distingush it.

Say's species is described with only one spot, from which circumstance it has derived its name.

Many specimens of our species occurred in Farmington, near the margin of the Sandy River, on a species of Helianthus; a great many of these plants were almost wholly deprived of leaves, by their ravages.

49. GALLERUCA SALICIS.

G. capite nigro, sub-rugoso, canaliculato; labro testaceo; thorace nigro, rugoso, canaliculato; elytris sub-fuscis, densé punctulatis, aureo-sericeis, sub-sulcatis; pedibus fuscis.

Head black, somewhat rough, canaliculate: *antennæ* fuscous, hairy; basal joint paler: *labrum* testaceous: *thorax* black, rugose, narrowly margined with fuscous, with a concavity on each side: *elytra* blackish, sometimes paler toward the apex, somewhat pale golden sericeous, with two indistinct, very broad, shallow sulci, besides the marginal one; margin considerably dilated.

Length hardly two twentieths of an inch.

Occurred plentifully in the vicinity of Mount Abraham, on the leaves of *Salix eriocéphala.*

50. COCCINELLA CARDISCE.

C. capite fusco-testaceo; thorace nigro; margine antico et laterali lineâque angustâ luteis; guttâ albâ ad angulum posticum; elytris nigris, singulis guttis tribus marginalibus, unicoque basali albis; disco luteo, guttis tribus albis triangulariter dispositis; pedibus luteo-testaceis.

Head muddy-testaceous: *thorax* black; anterior and lateral margins, and a narrow line in the middle yellowish; posterior angles each with a white spot: *elytra* black, each with one snowy white spot at base, and three on the lateral margin; middle of each elytron with a large, sub-triangular, cordate yellow spot, having a white spot at each angle, the two confluent at the suture: *feet* yellow.

Length about one fifth of an inch.

Occurred at Hallowell in the month of July, on currant bushes.

51. COCCINELLA BI-GEMINATA.

C. corpore punctulato, penitus nigro, maculis quatuor rufis duobus anterioribus ad marginem thoracis, duobus posterioribus ante apicem ad marginem elytrorum; thorace convexo.

Body all black, punctured, with four round red spots, two occupying the margin of the thorax, and two on the elytra, placed one on each side near the margin, just above the apex: *thorax* convex: *feet* black.

Length less than three twentieths of an inch.

Occurred on the highest summit of the Blue Mountains.

Allied to the C. *proba*, Say, &c.

51. COCCINELLA DISJUNCTA.

C. capite thoraceque nigris, albo variegatis; elytris rufo-sanguineis, fasciis duabus macularibus pedibusque nigris..

Head black, with a white spot on each side, half surrounding the eyes: *thorax* black with a white spot on each side, enclosing a black dot, two white spots at base, and one on the anterior margin: *elytra* red, with two fasciæ on each; the first behind the middle, composed of three, the second, above the apex, of two confluent black spots: body *beneath,* and *feet* black.

Length not quite one fifth of an inch.

52. COCCINELLA OBLIQUA.

C. corpore nigro, punctulato; thoracis margine lineâque mediâ angustâ, testaceis; elytris nigris, maculâ obliquâ rufo-sanguineâ; femoribus nigris; tarsis testaceis.

Body black, punctured: *labrum* pale; anterior and lateral margin of the *thorax* and narrow line along the middle, testaceous: *elytra,* each with an oblique red spot: *thighs* black: *tibiæ* half black, and half testaceous: *tarsi* wholly testaceous.

Length about one fifth of an inch.

NOTE. (TENEBRIO [Upis] CÆRULEUS). p. 20. Having examined this insect, we are satisfied that according to the system of Latreille, in the second edition of Cuvier's *Regne Animal,* it must be placed among the Œdemerites, in the genus Dytilus. It appears to be a a congener of *Necydalis melanira,* of Fabricius, the type of Ct. Dejean's genus Anogcodes.—*Pub. Com.*

ART. II.—DESCRIPTIONS OF NEW SPECIES OF COLEOPTEROUS INSECTS INHABITING THE STATE OF MASSACHUSETTS. By J. W. Randall. Communicated Oct. 18, 1837.

1. Clivina elongata.

C. corpore elongato, nigro, margine elytrorum rufo aut ferrugineo; disco suturaque nigris; antennis pedibusque ferrugineis.

Body elongate, black: *antennæ* ferruginous, middle groove upon the head strongly marked: *thorax* nearly quadrate, with the posterior angles gradually rounded; longitudinal channel rather deeply impressed: *elytra* with distinct punctured striæ, having four impressed points on the third; margin broadly bordered with rufous, the border dilating at base till it almost reaches the suture: *feet* reddish brown.

Length full one fifth of an inch.

Inhabits Boston, Mass., April.

2. Chlœnius niger.

C. corpore dilatato, atro; thorace sub-quadrato, latè sulcato, profundè punctulato, medio striato; elytris profundè striatis, pubescentibus, vix basi thoracis latioribus.

Body entirely black, head smooth, with a few punctures between the eyes: *thorax* nearly as broad at base as the elytra, with numerous great punctures which are most dense upon the margin, also upon the basal depressions, which are broad and deep, and on each side of the median line, which presents a stria deeply impressed in the middle of a broad sulcus; the intermediate spaces present polished surfaces interrupted by large, scattered punctures: ***elytra*** deeply striate, pubescent, densely but rather minutely punctured.

Length over one half an inch.

A rare insect; inhabits the vicinity of Boston; only males have as yet occurred.

3. CHLŒNIUS PURPURICOLLIS.

C. corpore sub-dilatato; articulo primo antennarum pallido, ceteris fuscis; capite nigro, polito; thorace violaceo, profundè punctulato; elytris nigris aut nigro-purpureis, tenuiter striatis, vix basi thoracis latioribus.

Body somewhat dilated: first joint of the ***antennæ*** pale, the rest fuscous: ***head*** black, polished: ***thorax*** broadest at base, where it is about as wide as the base of the elytra, pale violaceous with profound scattered punctures, most dense about the basal depressions and toward the posterior angles; a row of large punctures on each side the median line, which is finely impressed: ***elytra*** black or purplish black, punctures dense and small; striæ finely impressed; intermediate spaces flat: ***legs*** and ***underside*** of the body black.

Length less than four tenths of an inch.

4. ELATER EXIGUUS.

E. corpore nigro, subrugoso; thorace convexo, margine curvato, lineâ elevatâ ad medium, interdum obsoletâ; elytris striatis, flavo bimaculatis, maculâ superiori subfasciatâ; pedibus pallidis.

Body short and thick, black above, with a yellowish scattered pubescence, distinct in some lights, minutely rugose, especially upon the ***thorax***, which is, in most specimens, somewhat semi-globose, with a regularly curved margin and rather obtuse posterior angles, slightly curving outwards: *elytra* very distinctly striate, each with two yellow spots, the superior ones fasciate: *antennæ* slightly serrate, dusky, basal ones paler: *feet* pale.

Length from more than one tenth to more than three twentieths of an inch.

The superior spot on the elytra is liable to vary in its form in different individuals, being sometimes reduced almost to a point.

Several specimens occurred in Cambridge, Mass., July, 1833.

5. ELATER ACUTIPENNIS.

E. corpore fusco, sub-dilatato; thorace piloso, margine sub-curvato, angulis posticis sub-obtusis; elytris indistinctè punctulatis, striis tenuiter impressis, apice producto, per-acuto; pedibus piceis.

Body pale reddish brown: fourth joint of the *antennæ* much longer than the third, which is a little larger than the second and third: *thorax* darker than the elytra, pilose, median sulcus reduced to a very small channel at base; breadth at the anterior angles much less than at the posterior, being not greatly wider than the head; margin gradually curving anteriorly; posterior angles rather obtuse, directed but slightly outwards: *scutel* rounded: *elytra* indistinctly punctured, somewhat pubescent, with rather shallow striæ; apex produced to a very sharp point: *feet* piceous.

Length four tenths of an inch.

Readily distinguished by the sharp termination of the elytra.

Specimens occurred at Boston, April, 1829.

6. ELATER SUBLUCENS.

E. corpore elongato, sub-cupreo, subtus rufo; antennis serratis; thorace punctulato, ante medium bi-impresso, angulis anticis sub-rotundatis, lateribus et angulis posticis sub-rectis, ferrugineis; elytris striatis et punctulatis; pedibus rufo-ferrugineis.

Body elongated, pale coppery, beneath reddish or reddish ferruginous: *antennæ* serrate, fourth joint scarcely longer than the third, which is longer than the second; first two joints brownish: *front* with an impression: *thorax* sub-elongate, punctured, rather broader at base than anteriorly, an impression on each side before the middle; median sulcus impressed only from behind the middle to the base; anterior angles rounded, sides nearly straight, posterior angles nearly in a line with the margin, considerably produced, but only moderately acute; their color is ferruginous, which also tinges the margin to some extent: *elytra* striate, punctured, gradually tapering: *feet* reddish ferruginous.

Length less than four tenths of an inch.

Occurred at Cambridge, Mass., June, 1832.

7. ELATER BIGEMINATUS.

E. corpore nigro; antennis serratis; thorace longiore quam lato, lateribus sub-parallelis, angulis posticis sub-rectis; elytris striatis, fulvo bi-maculatis.

Body black, moderately slender: *antennæ* brownish, joints rather closely set, second and third nearly equal: *thorax* longer than broad, indistinctly punctured, not channeled except obsoletely at base; sides nearly parallel; posterior angles nearly in a line with the sides, hardly acute, not greatly produced: *elytra* moderately tapering, with punctured striæ; interstitial spaces scarcely convex, an elongate yellow spot on each side above the middle and a more rounded one below it: *feet* brownish.

Length from nearly to about one fifth of an inch.

Cambridge, Mass., July and August,—rare.

8. ELATER (Eucnemis) SUBRUFA.

E. corpore elongato, angustato, rufo; articulis quinque ultimis antennarum crassis; clypeo sub-convexo; oculis nigris; thorace sub-quadrato, punctulato; elytris indistinctè striatis et punctulatis; pedibus sub-rufis.

Body elongated, narrow, rufous, especially the *thorax* which is sub-quadrate, punctured, with nearly straight posterior angles and without the longitudinal furrow: *antennæ* reddish brown, gradually thickening from the seventh joint inclusive: *clypeus* rather full: *elytra* striate and punctured but rather indistinctly: *feet* reddish.

Length three tenths of an inch.

Referable to the genus Eucnemis according to Mannerheim, though not according to the strict limitation of that genus by Latreille. For my specimen I am indebted to Dr. Samuel Foster, who obtained it at Greenfield, Mass.

9. BUPRESTIS (Agrilus) VITTATICOLLIS.

A. corpore atro, subtus purpureo; thorace sub-quadrato, vittis duabus purpureis denudatis; elytris subtiliter rugosis, marginibus sub-parallelis, apicibus rotundatis; abdominis margine vittâ fulvâ pilosâ et sub-metallicâ ornato.

Body black: *antennæ* quite short, coppery: *front* with short yellowish hairs on a purple ground: *eyes* black: *thorax* sub-quadrate, rather broader than long, sides somewhat depressed and curving, apparently with five vittæ, three of them, viz. the middle and marginal ones, composed of short yellowish hairs, and the other two purplish, owing to the spaces which they occupy being denuded: *elytra* rather finely rugose, sides sub-parallel, a little depressed above the middle; apices rather obtusely rounded: *pectus* purplish: *abdomen* black or purplish black, with a marginal vitta of yellowish hairs presenting a somewhat metallic appearance.

Length from a little over three tenths to nearly four tenths of an inch.

Both sexes occurred July, 1833, in Cambridge, Mass.

10. TACHINUS GEMINATUS.

T. corpore lævi, brevissimo, nigro; antennis nigris; thorace transversè quadrato, testaceo marginato; elytris testaceis; margine supra medium et maculâ magnâ elongatâ centrali, nigris; pedibus testaceis.

Body smooth, black, very short: *antennæ* black: *thorax* transversely quadrate, margined laterally with testaceous: *elytra* testaceous except the sides superiorly, and a large spot on the middle of each, which are black; bristles towards the apex rather numerous and stout: *feet* testaceous.

Length from one tenth to little more than one tenth of an inch.

This species varies somewhat in color in different specimens. Sometimes the black spot of the elytra occupies nearly the whole surface, and sometimes the sides of the elytra are wholly testaceous.

Occurred abundantly about manure, Sept. 1834, at Brookline, Mass.

11. Hister brunneipennis.[*]

H. corpore sub-quadrato, sub-brunneo; thorace utrinque profundè et obliquè sulcato; elytris, lineis tribus indistinctè elevatis, et gradatim obsoletis.

Body sub-quadrate, rounded upon the sides, reddish-brown: *thorax* with a profound, oblique sulcus on each side, dividing it apparently into three lobes; disk smooth, from the sulci to the margin roughened: *elytra* each with three indistinctly elevated lines, becoming gradually obsolete, and giving to the intermediate spaces the appearance of broad, shallow striæ; posteriorly with a few minute punctures, and distinct scattered hairs.

Length about eight hundredths of an inch.

Cambridge, Mass., March, 1831.

12. Hydrochus subcupreus.

H. corpore griseo, sub-cupreo; clypeo valdè prominenti; thorace vix sub-quadrato, profundè punctato; elytris sub-convexis, thorace latioribus, profundè striato-punctatis; pedibus piceo-testaceis.

Body grayish, copper-colored: *head* punctured, prominent: *clypeus* having an impressed border, anteriorly greatly prominent: *eyes* black, prominent: *thorax* profoundly punctured, rather longer than broad, rather widest at middle, behind which it is gradually but slightly contracted; posterior margin rounded at middle, anterior one truncate: *elytra* rather convex, with striæ of profound punctures; intermediate spaces somewhat convex.

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[*] This insect appears to be an immature specimen, and, on that account, not entitled to the name of a new species.—*Pub. Com.*

Length from more than two twentieths to about three twentieths of an inch.

Cambridge, Mass. Occurs not unfrequently during the spring and autumn, in small sluggish streams.

13. LIXUS RUBELLUS.

L. corpore elongato, sub-brunneo, pilis minutis ferrugineis et griseis densè tecto; rostro leviter arcuato, carinato; thorace angustato, inequaliter punctulato; elytris striato-punctatis, apice obliquè subtruncato, producto.

Body elongate, brownish, densely covered with small reddish-ferruginous and grayish hairs; beneath with yellowish-ferruginous and cinereous hairs: club of the *antennæ* canescent, somewhat elongate pyriform, last joint somewhat acute: *rostrum* carinate to the tip, rather depressed, but very slightly arcuated; together with the head a little longer than the thorax: *eyes* small and black: *thorax* of about the same width at base with the base of the elytra, gradually and very considerably narrowing before; above, somewhat elevated on each side, the middle punctures unequal, mostly rather large, but not very profoundly impressed: *scutel* not perceptible: *elytra* with moderately regular striæ of punctures, very slightly truncated at tip upon the inner side, and terminating in a considerably produced, though somewhat obtuse point, curving slightly outward: *legs* brown: *abdomen* beneath with little canescent cirri.

Length from the tip of the rostrum nine twentieths of an inch.

A somewhat narrow and elongated species, and occurred in Cambridge, Mass.

14. LIXUS CALANDROIDES.

L. corpore crasso, pilis cinereo-canescentibus, densè et undique tecto; rostro crasso, sub-brevi, posticè carinato, anticè sub-excavato, denudato; thorace, spatiis denudatis, trivittato, anticè carinato, posticè canaliculato, profundè punctato; elytris convexis, profundè striato-punctatis, apice obtuso.

Body stout, densely covered in every part, with rather stout, whitish cinereous hairs: *rostrum* stout, including the head, about as long as the thorax; behind carinate, before, near the tip, naked and slightly excavated: *eyes* large: *thorax* not narrowed anteriorly, till near its junction with the head, carinate before, canaliculate behind, punctures very large and profound: *scutel* immersed: *elytra* convex, rather widest below the middle, with striæ of moderately distant, very distinct punctures. The whole insect appears of a grayish white color, owing to the hairs, which densely cover the surface.

Length about nine twentieths of an inch.

A stout species, and occurred on Chelsea Beach, Mass.

It would seem to agree in some respects with the L. *præpotens*, Schöen., but wants the broad black vitta on the elytra, which that insect possesses.

15. STENOCORUS UNICOLOR.

S. corpore gracili, sub-cylindrico, sub-rufo; capite tenuiter canaliculato; antennis sub-pilosis, articulo tertio sequentibusque uni-setosis; thorace cylindrico, profundè punctato; elytris profundè punctatis, lateribus parallelis, apice sinuato-truncato, externè acuto; pedibus gracilibus, tarsis pilosis.

Body elongated, nearly cylindric, entirely of a light brownish red: *head* punctured anteriorly, finely canaliculate: *antennæ* somewhat hairy, as long as the body, rather slender and tapering, first joint very distinctly punctured, third and fourth with a distinct bristle at tip, and the succeeding ones with a gradually less distinct one; *palpi* pale: *eyes* black: *thorax* cylindrical, nearly one half longer than broad, with large punctures: *scutel* somewhat ovoid: *elytra* broader than the thorax, elongate, punctured; sides parallel; apex somewhat sinuato-truncate, produced on the outer side to a very sharp point: *feet* slender, hairy, especially the tarsi.

Length about one half an inch.

Occurred in Brookline, Mass.

16. SAPERDA TRIGEMINATA.

S. corpore brevi; antennis pilosis, geniculis uni-setosis; capite, thorace, marginibusque elytrorum fulvo-velutinis; thoracis disco maculis denudato; elytris profundè punctulatis, disco nigro, denudato, lateribus parallelis; corpore subtùs, pedibusque cinereo-pubescentibus; tarsis subtùs fulvo-lanuginosis.

Body short, rather stout: *antennæ* about as long as the body, cinereous, with short hairs, most of the joints with a fine bristle beneath: *head* and *thorax* together with the sides, apices and suture of the elytra, yellow, owing to the dense, closely set hairs which cover those parts: *front* with a small naked space: *eyes* black: disk of the thorax with four naked black spots, placed relatively to each other as the angles of a square; sides, each with one spot; middle space of each elytron profoundly punctured and presenting to the eye a broad black, naked vitta: body *beneath* and *feet* covered with short cinereous hairs: *tarsi* beneath somewhat tufted with pale yellowish hair.

Length about three tenths of an inch.

Occurred in Cambridge, Mass., July, 1833.

17. LEPTURA SUBHAMATA.

L. corpore nigro; fronte canaliculatâ; articulis quinque primis antennarum nigris, ceteris anticè nigris, posticè testaceis; thorace punctulato, sub-fulvo, sericeo; elytris punctulatis, parcè pilosis, sub-attenuatis, vittâ sub-abbreviatâ fulvâ ad medium interruptâ et suprà clavatâ; apice curvato-truncato, exteriùs acutè producto; pedibus elongatis, nigris; femoribus subtùs testaceis.

Body black: *head* somewhat rounded above: *front* canaliculate: *eyes* somewhat fuscous, towards the sides, convex: *antennæ* about as long as the body, first five joints black, the rest half black and the inferior half testaceous: *thorax* elongated, punctured, sub-cylindric, somewhat yellowish sericeous, with a transverse impression above the base; sides with a curved contraction behind the middle, then dilating rather suddenly toward the posterior angles; posterior margin rounded toward the elytral suture: *elytra* punctured, gradually attenuated toward the apex; punctures furnished with hairs; humerus continuing the curve from the base of the thoracic margin; a yellowish vitta on each side extending two thirds the length of the elytra, interrupted in the middle, and sub-clavate anteriorly; apex somewhat curvato-truncate, elytra rather acutely produced on the outer side: *legs* black except the thighs which are testaceous on the side.

Length rather over one half an inch.

Closely allied to the L. *vittàta*, Oliv. and was obtained by Mr. Andrew Foster in the notch of the White Mountains, N. H.

18. LEPTURA CINNAMOPTERA.

L. corpore attenuato, cervino ; capite supra canaliculato, labro palpisque fulvo-testaceis ; antennis gracilibus, fulvo-testaceis ; thorace valdè elongato, sub-cylindrico, profundè transversèque sulcato, lateribus uni-tuberculatis ; elytris pubescentibus, vittà suturali indistinctà, pubescenti ; apice indistinctè truncato, vix producto ; pedibus fulvo-testaceis, elongatis, pubescentibus.

Body attenuated, pale cinnamon color : *head* canaliculate above : *labrum* and *palpi* yellowish-testaceous : *mandibles* blackish : *antennæ* hardly as long as the body, slender, yellowish-testaceous ; first joint darker and somewhat curved, eyes black, prominent : *thorax* half as long again as broad, irregularly subcylindric with a dilated tubercle on each side ; part before the tubercles much contracted : *scutel* triangular, pubescent : *elytra* indistinctly punctured, pubescent, especially on each side of the suture where it is condensed into an indistinct vitta ; between the humerus and suture is an indistinctly impressed line ; apex rather obtuse, very slightly truncate, exteriorly obtusely and almost imperceptibly produced : *legs* elongate, pubescent, yellowish.

Length rather less than one half an inch.

Occurred in Cambridge, Mass., July, 1831, on the leaves of the shrub oak.

19. CRYPTOCEPHALUS CINCTIPENNIS.

C. corpore subtùs nigro, ano rufo ; antennis, palpis et pedibus subrufis ; thorace sub-rufo, margine testaceo ; elytris striato-punctatis, atris, latè albo marginatis, basi lineâ abbreviatâ albâ.

Head rufo-testaceous : *eyes* black : *antennæ* blackish, basal half pale rufo-testaceous : *thorax* somewhat rufous, with a whitish margin; punctures minute, moderately dense: *elytra* with striæ, of close-set, profound punctures; disk black, lateral and terminal margins with a broad, yellowish white border; base on each side of the suture, with an abbreviated, yellowish white line: *legs* reddish-brown: body *beneath*, black, tip of the abdomen reddish-brown.

Length about one fifth of an inch.

Occurred at Cambridge, Mass. on the leaves of *Aster puniceus.*

20. CRYPTOCEPHALUS MARGINATICOLLIS.

C. capite nigro, utrinque lineâ albâ inter oculos; antennis subfuscis; thorace densè punctato, undique albo-marginato, lineâ abbreviatâ albâ ante medium; elytris albo tri-vittatis, apice albo; pedibus fusco-testaceis.

Head black, densely punctured; a white line on each side between the eyes: *antennæ* somewhat brownish-fuscous: *thorax* very densely punctured, almost granulated, margined on every side with white, but more narrowly before and behind; a white line extends from the base to below the middle: *elytra* with irregular striæ of profound punctures, which become broken toward the apex into scattered points; each with three whitish vittæ uniting at the apex; sutural one much interrupted by the irregular striæ of punctures; body *beneath* black; tip of the abdomen white: *feet* fusco-testaceous.

Length about one twentieth of an inch.

Occurred in West Cambridge, Mass. on the leaves of Hickory trees. It seems to be allied to the C. *lituràtus* Fabr. but is yet sufficiently distinct.

21. HALTICA FUNEREA.

H. corpore elongato-ovato, atro, lævi; abdominis apice albo.

Body elongate ovate, smooth but scarcely polished, entirely black except the tip of the abdomen beneath, which is yellowish white; *head* with a slight cross-like impression between the antennæ.

Length rather above five twentieths of an inch.

Occurred at Canton, Mass.; rather a large species and is quite distinct from any other that I have seen.

22. HALTICA (Œdionychis, Latr.) PALLIATA.

H. corpore subtùs nigro; capite thoraceque fusco-fulvis; elytris sub-flavis, densè punctulatis, anticè interdum nigro bi-maculatis interdum sub-fasciatis, fasciâ mediâ nigrâ et undulatâ; pedibus sub-fulvis.

Head dingy yellowish: *antennæ* between, somewhat hairy: *thorax* yellowish, with an almost obsolete dusky spot on each side; *elytra* densely punctured, yellowish, anterior half with two spots on each side placed one above and within the other: sometimes all the spots commingle, forming transverse irregular fasciæ; middle with a transverse, black, undulated fascia, composed apparently of large confluent black spots: *feet* yellowish.

Length three twentieths of an inch.

A species liable to vary somewhat in its markings—has occurred rarely in the vicinity of Boston. It is referable to the genus Œdionychis of Latr. and the inflation above of the penultimate joint of its posterior tarsi is very distinct.

23. HALTICA (Œdionychis, Latr.) CIRCUMDATA.

H. capite sub-nigro; antennis sub-fuscis; thorace testaceo; elytris atris, densè punctulatis, margine testaceo; pedibus fusco-testaceis.

Head somewhat black: *antennæ* brownish: *thorax* testaceous: *elytra* black, densely punctured, with a testaceous margin: *feet* pale brownish: body *beneath* black, inclining to brown.

Length three twentieths of an inch.

Vicinity of Boston, rare.

Similar in form to the preceding, and is referable to the genus Œdionychis, Latr.

24. LANGURIA BREVICOLLIS.

L. corpore sub-crasso, nigro aut æneo-nigro; antennis nigris, brevibus; capite transverso; thorace sub-cylindrico, brevi, supra sub-quadrato, leviter punctulato, posticè producto; elytris striato-punctatis, parum convexis; pedibus valdè crassis.

Body rather stout, black, slightly bronzed: *antennæ* black, short; *head* transverse: *thorax* sub-cylindrical not greatly longer than broad, above nearly quadrate, not distinctly punctured, except under a glass of considerable power; somewhat elevated along the middle, behind somewhat produced and rounded: *scutel* sub-triangular; *elytra* wider than the thorax, a little convex, with regular striæ of rather profound punctures: *feet* very stout.

Length from a little less to about one fifth of an inch.

An abbreviated species readily distinguished by its short thorax. Specimens occurred in May and June 1832, at Cambridge, Mass.,—rare.

25. Languria inornata.

L. corpore elongato, sub-cylindrico, atro; thorace elongato, leviter punctulato; scutello sub-cordato; elytris distinctè striato-punctatis.

Body linear, elongate, somewhat flattened, cylindric, entirely black: *head* and *thorax* lightly punctured, the latter nearly one half longer than broad; sides at base a little narrowed: *scutel* somewhat short, cordate: *elytra* with distinct striæ of punctures; *feet* black.

Length three tenths of an inch.

Occurred in Cambridge, Mass. June, 1832, and is allied to the L. *lineàta*, H. Cat., but the thorax in that species is margined with red, which is not the case here. The present two species, together with the L. *lineàta*, increase the number of described species in this genus to ten.

26. Coccinella notans.

C. corpore sub-rotundato, lurido; fronte rugosâ; utrinque lineâ fulvâ; thorace sub-lævi, marginibus anticè lateralibusque flavis, his nigro pupillatis; corpore subtus fusco; pedibus nigris; tarsis fuscis.

Body rounded, obscure brownish; *head* roughened in front, a whitish line on each side: *thorax* before and on the sides bordered with whitish, a large black spot on each side being included in the colored margin: body *beneath* brownish: *legs* black: *tarsi* brownish.

Length nearly three tenths of an inch.

Occurred on Chelsea beach, where it was washed up by the tide.

27. COCCINELLA AFFINIS.

C. corpore sub-rotundato, nigro; thorace punctulato, lateribus anticè sub-flavis; elytris punctatis, maculâ mediâ sanguineâ.

Body somewhat rounded, black: *thorax* lightly punctured; margin with a yellowish border, broad before, gradually diminishing behind; *elytra* more profoundly punctured than the thorax, with a small red spot in the middle of each.

Length four twentieths of an inch.

Occurred in the vicinity of Boston, allied to the C. *normàta* and the C. *binotàta* of Say, and to the C. *oculàta* of Fabr. but is larger than these species.

28. COCCINELLA SIMILIS.

C. corpore rotundato, nigro, punctulato; thoracis marginibus antico et laterali angustè flavo-marginatis; elytris posticè obsoletè flavo-marginatis, maculà mediâ grandi sub-cordatâ flavâ; abdominis margine flavo-testaceâ.

Body rounded, black: *head* punctured: *eyes* blackish, fuscous: *palpi* pale: *labrum* margined with yellowish: *thorax* before and on the sides with a narrow yellowish border, an obsolete yellowish line at base extending to the middle; surface punctured: *elytra* more deeply punctured, posteriorly with a very narrow, almost obsolete testaceous margin, terminating before in a faint spot: *abdomen* beneath margined with yellowish.

Length between four twentieths and five twentieths of an inch.

Occurred on Chelsea Beach, Mass., where it was washed up by the tide. It resembles, at first sight, the C. *cacti*, Fabr., but differs in the shape of the thorax and the elytral spots.

29. Coccinella multiguttata.

C. corpore punctato, elongato-ovato; capite flavo, basi. utrinque nigro; palpis antennisque pallidis, oculis nigris; thorace flavo, utrinque confluento-trimaculatis; elytris flavis, singulis 7, 8 aut 9 maculatis, maculis confluentibus; pedibus flavis.

Body punctured, elongate-ovate: *head* yellowish, base on each side black: *eyes* black: *palpi* and *antennæ* yellowish: *thorax* yellowish, with three confluent spots on each side: *elytra* yellowish, with seven, eight, or nine black spots, accordingly as they are more or less confluent: body *beneath* black; margin yellow: *feet* yellow.

Length from more than two twentieths to less than three twentieths of an inch.

Cambridge, Mass., on the leaves of trees; rare; allied to the C. 10-*maculàta*, Fabr. and to the C. *tibiàlis* and C. *parènthesis*, Say.

30. Coccinella picta.

C. corpore nigro, rotundato-ovato; capite fulvo trimaculato; thorace marginibus antico lateralique luteo, anticè luteo-trimaculato, maculis margine confluentibus; basi luteo-bimaculata; elytris luteis, fasciis duabus, nigris, transversis, undulatis, confluentibus; pedibus flavo-testaceis.

Body round ovate: *head* black, with three yellow parallel lines: *thorax* black, anterior and lateral margins yellow; the yellow spots before, confluent with the margin, of which the middle one is large and irregular, the lateral ones reduced to slight lines; base with two yellow spots: *elytra* finely punctured, half yellow and half black, the black color being disposed in two transverse undulating fasciæ, one on the middle and one behind it, the two laterally confluent: body *beneath* black: *feet* yellowish.

Length from more than three twentieths to about three twentieths of an inch.

This species is subject to great variation according to the greater or less predominance of either color in the elytra. The two extremes may be described under the following heads:

A. where the elytra are wholly yellowish-testaceous.

B. where they are nearly black.

The thoracic spots are almost always present, though often faintly defined. It has only occurred on Chelsea beach, where it is at times found cast up by the waves.

31. COCCINELLA LUGUBRIS.

C. corpore nigro, rotundato, convexo, lævi; margine thoracis albo; elytris albo-bimaculatis, margine exteriori antice albo postice nigro; pedibus nigro-fuscis.

Body black, rounded, convex, almost semi-globose, smooth; margin of the thorax white: *elytra* with a white spot placed near the middle, and another above the apex; margin from the base to a little distance behind the middle with a white border, widened posteriorly: *feet* blackish inclining to brown.

Length rather above one tenth of an inch.

Occurred at Cambridge, Mass. rare.

Nearly allied to the C. *proba*, Say; it is a little larger.

ART. III.—DESCRIPTIONS OF NEW SPECIES OF MOLLUSCA AND SHELLS, AND REMARKS ON SEVERAL POLYPI FOUND IN MASSACHUSETTS BAY. By Joseph P. Couthouy. Read January 17, 1838.

In offering the following paper, I would state, in the first place, that nothing is herein described which has not fallen under my own personal observation. With regard to those which I have considered as new species, it may prove, hereafter, that some which I have regarded as such, have already been described by English naturalists as inhabiting the coasts of the British Islands. After an examination, however, of the descriptions within my reach, and a comparison with the plates, where they existed, I have been wholly unable to satisfy myself of the positive identity of any one species. It has frequently occurred that a description has tallied very nearly with an object presumed to be new, when the accompanying plate has represented something widely different. On the other hand, figures have been found apparently corresponding to some of our species, where the description has been applicable only in one or two characters, which belonged in common to the whole genus. In some instances, it is true, the descriptions, so far as they extend, seem to coincide with those here given in most of the important specific distinctions; but they omit much that is of equal importance, and, in justice to the describers, could hardly be supposed to have escaped their notice, if it really existed in their specimens.

These remarks refer more especially to the shells found upon our coast. There can at present be but little doubt, that even so accurate an observer as the lamented Say has erred in describing as new many species previously well known to European naturalists. Nor is this at all surprising, when we consider the difficulties under which, in common with ourselves, he labored, in not possessing specimens from their coasts for comparison; and the paucity of satisfactory works on this branch of natural history to be procured in our country at the time he wrote,—defects which even yet are most sensibly felt by us all.

Of the difficulty of determining species from descriptions alone, where, as in many genera, the specific differences are so slight, it is hardly necessary to speak; and the uncertainty of judgment founded upon figures alone is perhaps still greater. I have therefore preferred furnishing a full description and applying a specific name of my own, wherever there appeared to exist reasonable grounds for so doing. It seemed to me advisable, where the point was doubtful, to risk rather the addition of a synonym to a known species, than to apply existing names to such as were actually new.

It may here be stated, that of the Annulata, two species of Amphitrite and one of Sabellaria have been found in our vicinity; but not having been able to decide with any certainty upon their being described or not, they are not here included. I am inclined to refer one of the Amphitrite to the *penicillus*, Lk.

TUBULARIA INDIVISA, Ellis?

T. indivìsa, *Ellis Coral.* p. 31. t. 16, f. C.
Tubulària calamàris. *Pall., Elen. Zooph.* p. 2. No. 38.

Tubulària indivìsa, *Lin.*
" " *Lamour., Polyp. flex. pag.* 230. *and Expos. Meth. des Polyp. p.* 17.
Tubulària indivìsa, *List., Philos. Trans.* 1834. *pag.* 366. *tab.* 8. *fig.* 1.
Tubulària calamàris. *Ehren., Mem. sur les polyp. de la Mer Rouge. p.* 71.
T. indivìsa. *Shaw, Zool. Misc. July,* 1799. *n.* 392.

I am doubtful whether the superb specimens of Polypi deposited by me in the Society's collection, actually belong to the species here named, or are as yet undescribed. The account by Ellis is very meagre, saying nothing of the form or coloration of the polýps; and the figure by Shaw is but little more satisfactory. I have not seen the other figures above referred to. If the species are identical, our specimens attain probably a larger size, and are more beautiful than their fellows of the European shores. I have seen isolated specimens of at least a foot in length, with the peduncle the size of a large straw, and the polyps one and a half inches in diameter. The stems are usually of a pale flesh color, the tentaculæ somewhat darker, and the central portion a deep crimson, often filled with pendulous clusters of ova of a lighter color, in form like minute clusters of grapes. It is impossible to imagine a more beautiful object than is presented by a group of these animals, seen in the clear water by a bright sunlight, as they wave to and fro in the current. In the delicacy of their petals, if they may be so termed, and the depth and brilliancy of their colors, they are equalled by few of the flowers of earth.

TUBULARIA CORONATA, Mull.

Zool. Dan. vol. iv. pag. 25. *tab.* 141.

This species is very distinct from the preceding, by being in every respect much smaller, and, instead of growing in tubes detached or connected only at the base, it is found in clusters composed of innumerable ramifications. The stems or peduncles are of a bright rose color, the interior tentaculæ upright, penicillate and of rather a deeper color.

TUBULARIA STELLIFERA.

T. tubulis brevibus, simplicibus, aggregatis, carnosis, stellis parvulis purpureis coronatis.

T. with short, simple, fleshy, rose colored peduncles, associated in masses or clusters, but not ramose; each stem rising from a separate base; the polyps small, stelliform; inferior tentaculæ of a beautiful purple and highly contractile; superior or internal ones of a bright crimson. Height of peduncle about ten fortieths, diameter one fortieth; diameter of polyps four fortieths of an inch.

Habitat Boston Harbor.

This delicate species was found by me the summer before last, growing about the bottom of the piles at Craigie's bridge, in the neighborhood of which, it should have been observed, the two preceding species were also found. At first sight it very much resembled some of the cryptogamous plants; and it was not till after a close examination that I was convinced of its being a polyps. I have no doubt, after comparing it with the descriptions of known species, that it is as yet undescribed. Repeated efforts for the preservation of specimens proved fruitless, owing to the extreme delicacy of their texture and coloration, both of which were destroyed almost immediately upon immersion in any spirituous solution.

OPHIURA LACERTOSA? Lk.

Stella longicáuda, LINCK? *St. p.* 47, *tab. xi. no.* 17. *planè conch. t.* 4. *f.* 4.

Found in great numbers in the stomachs of fishes caught in our outer Bay. Color varies from uniform dark brown or black, to reddish or yellow, sometimes having the rays barred transversely with red and black or brown and yellow. No specimens entirely perfect were ever obtained. There is also another species of Ophiura, of which only small portions of the rays were met with, whose upper surface was somewhat carinate or angular instead of rounded or depressed, as in this.

ACTINIA PLUMOSA, Mull.

Zool. Dan. t. 88. *f.* 1. 2.

Seen about the bridges over Charles River, in considerable numbers, the past summer.

ACTINIA SENILIS, Lin.

Syst. Nat. p. 1088. *&c.* Common about the rocks at low water mark off the Harbor of Gloucester. Specimens were occasionally met with of more than four inches in diameter when fully expanded. The colors varied from reddish or purplish to a yellowish white, presenting a very beautiful appearance where the animals were grouped in any number.

HOLOTHURIA CHRYSACANTHOPHORA.

H. tentaculis —? corpore molli, cylindrico, cinereo-lutescente, spinis aureis, exilibus, frequentibus instructo.

Holothuria with —? tentaculæ; body soft and of an ashy yellow color, divided into five compartments by as many dotted longitudinal lines, covered with minute blackish grains, easily effaced by rubbing; numerous slender spines of a bright golden hue and varying in length from one eighth to four eighths of an inch, are irregularly disposed over the whole surface, in the greatest numbers around the mouth.

Length four to five inches.

Hab. Massachusetts Bay.

Collection of Bost. Soc. Nat. History.

OBSERVATIONS. This species which, by its prominent, needle-like spines, appears to form a link between the Echini and Fistulides, was obtained from the vicinity of Cape Ann. Unfortunately, none of the specimens were found perfect about the mouth, and in most, the spines had nearly all fallen off; the description is therefore necessarily deficient. Nevertheless, amply sufficient remained to distinguish this from any known species, and enable the perfect animal to be identified with ease. The spines do not appear to be calcareous in their composition, but rather an indurated prolongation of the muscle connecting them with the internal membrane. They are slightly curved at their termination, and capable of being withdrawn into the body or moved with freedom in any direction. Specimens in drying contract to less than one third their natural size, and assume a dark, semi-transparent, corneous appearance, very similar to that of the celebrated *Biche le mer*, which constitutes so important an article of commerce in the Eastern Archipelago.

HOLOTHURIA, (an spec. nov.?)

An animal apparently of this genus was procured from our outer Bay, with the upper extremity much lacerated by the fish from which it was taken. The body was rigid, fusiform, transversely rugose, sub-pentagonal, densely covered with a fine, pulverulent coating of a dark, shining, bronze color. The specimen in the Society's collection was about two inches in length, having contracted about one third by dessication.

TELLINA SORDIDA.

Plate III, fig. 11.

T. testâ ovali, compressâ, albidâ, epidermide cornea tectâ; dentibus cardinalibus valvâ dextrâ duobus, altero simplici, altero bifido, sinistrâ plerumque obsoletis; lateralibus posticis remotis; intùs albâ.

Long. nineteen twentieths, lat. four twentieths, alt. twelve twentieths, of an inch.

Habitat Boston Bay.

My own collection and the Society's.

DESCRIPTION. Shell oval, somewhat compressed, equivalve, very inequilateral, slightly gaping, bluish white beneath a thin, fugacious, horn-colored epidermis; postapicial ligament large and prominent; præapicial, very small and internal; summits always eroded, and the adjacent parts of a chalky appearance; striæ of growth very numerous and distinct, and from about one third of the distance from the back to the ventral margin, projecting over each other in faint concentric laminations; anterior extremity very regularly rounded; posterior slightly angular, with the characteristic plait well marked; right valve with two cardinal teeth, the anterior one simple, the posterior bifid, or rather bi-cuspidate; left valve having them almost always obsolete; in a few cases a single slender posterior tooth is found, entering into the bi-cuspidate one opposite; a feeble compression and elevation of the posterior cardinal plates forms a remote, inconspicuous lateral tooth in each valve. Internal color an uniform milk-white, inclining to iridescence.

Observations. Several specimens of this shell were taken while fishing about two miles outside of Boston lighthouse. Its general aspect approaches that of *Sanguinolària fusca*, Conrad, but it is easily distinguished, by being less convex and rounded and more inequilateral, and by the fold upon the posterior portion. The internal color is moreover always white instead of yellowish or reddish, as in that shell.

It cannot be *T. alternidentàta*, Brod. & Sow., from the Arctic Seas, though their description is applicable in some points, as that is nearly two and a half inches in length and has two alternating cardinal teeth only in each valve. *T. inconspicua*, same authors, seems to approximate more closely, but has no lateral teeth (obsolete perhaps); the number of cardinal teeth is not stated. It would seem to be a much more convex shell than ours, its diameter being eight twentieths of an inch, or more than half its height, fifteen twentieths. From this circumstance, and their comparison of it to *T. solìdula*, Solan., it is doubtful whether their *T. inconspicua* is not identical with *S. fusca*, Conr., *Ps. fusca*, Say, of our own shores. A good figure would decide this question.

CARDIUM PUBESCENS.

Plate III. fig. 6.

C. testâ mediocri, obliquè rotundatâ, sub-æquilaterali, cinerescente; costellis 36, ciliatis; umbonibus tumidis; natibus approximatis; margine crenato; intus albo-lutescente.

Long. sixteen twentieths, lat. eleven twentieths, alt. fourteen twentieths, of an inch.

Hab. waters of Mass. Bay.

My cabinet, and that of Bost. Soc. Nat. History.

DESCRIPTION. Shell rounded obliquely, very nearly equilateral, thin: external color dull ashy white; posteriorly depressed, sub-cordate; margin rounded, also rounded anteriorly and a little narrowed; umbones somewhat inflated, summits incurved, approximate; anterior dorsal area inconspicuous, feebly impressed, sub-cordate, the posterior almost null, striated by the origin of the costæ, which are 36 in number, rounded, smooth, their upper edges covered with a short, downy ciliation of a dirty brown color; margins crenated internally; anterior lateral teeth conspicuous, posterior ones nearly obsolete; interior a brilliant yellowish-white, nearly a straw color at the margins.

OBSERVATIONS. Only four specimens of this shell were ever found by me, and those were obtained near Egg rock, off Lynn.

It is closely allied to C. *pinnulàtum*, Conrad, in form and coloration, but the number of the ribs is much greater, that having but 27, and it is without the imbrications on the costæ, the number of which also distinguish it from C. *édule*, Lin. which has but 26. This last has also a brown spot occupying the centre, internally, while ours is an uniform yellowish white. I have named it C. *pubèscens* from the downy ciliations upon the costæ, which give it that appearance. Most specimens were about half the size here given.

NUCULA MYALIS.

Plate III. fig. 7.

N. testâ ovatâ, sub-equilaterali, lævi, concentricè zonatâ; latere postico longiore et latiore, rotundato, antico sub-rostrato; natibus approximatis; dentibus rectis; epidermide olivaceo-nigricante.

Long. twenty-two twentieths, lat. seven twentieths alt. twelve twentieths of an inch.

Hab. (whole ?) coast of New England.

My own Cabinet.

Cabinet of Bost. Soc. Nat. History.

" of A. A. Gould, M. D. and D. H. Storer, M. D.

" of John C. Jay, M. D., N. York.

DESCRIPTION. Shell ovate, nearly equilateral, slightly gaping at both extremities, moderately convex, with numerous ridges of growth; summits antero-dorsal; posterior side rather more than half the whole length, posterior superior margin somewhat depressed, inferior rounded; anteriorly sub-rostrate, not truncated, slightly compressed laterally and superiorly, anterior dorsal area lanceolate, smooth, shiny, carinated and rectilinear in its whole extent from the beaks to the extremity, posterior dorsal area superficial, elliptical and finely striated; basal margin regularly curved and entire; ligamentary fossa median, triangular and profound: teeth from 20 to 22, posteriorly rectilinear, angulated anteriorly or internally and slightly inclined to the summits ; color of the interior dull yellowish-white ; muscular impression well defined, bi-partite, the anterior one rounded or oval, posterior sub-triangular ; epidermis thin, smooth, dark olive with paler zones interposed between the incremental lines.

OBSERVATIONS. This shell, taken from the stomachs of cod in various parts of our bay, has, at first glance, some likeness to *N. limátula,* Say ; but on inspection, it differs from that, in being much less rostrated, and the posterior side being the longer ; the epidermis is also much darker, and the dingy white of the interior very different from the pure brilliant white of Say's species. All the specimens of that, which have fallen under my notice, have a pale radiation extending from the summit toward either extremity, which is never found upon this shell.

In size and general aspect it is not dissimilar to N. *Nicobáricus,* Lk., an inhabitant of the Indian Ocean, differing from it principally in the position of the umbones.

It approaches, however, nearest to the fossil species found in Maryland and described by Mr. Say, under the name of N. *lævis,* in his American Conchology, and figured plate XII. of the same work. I have never seen the shell itself, but judging only from the description and figure, think it possible the *myàlis* may be the living analogue of the *lævis.*

I have named it *N. myàlis,* from the similarity of its configuration to that of the young of *Mya arenària,* Lk., for which, when deprived of its olivaceous epidermis, it might easily be mistaken. It does not appear to be a very uncommon shell, and it is a little surprising that it should have remained unknown to us so long.

NUCULA TENUISULCATA.

Plate III. fig. 8.

N. testâ elongatâ, inæquilaterali; latere antico longiore, attenuato, rostrato, postico rotundato; umbonibus prominulis, concentricè confertimque striatis, tenuissimèque sulcatis; colore virescente.

Long. fifteen twentieths, lat. four twentieths, alt. seven twentieths, of an inch.

Hab. waters of Mass. Bay.

My own Cabinet.

Cabinet of Bost. Soc. Nat. History.

" of A. A. Gould, M. D.

DESCRIPTION. Shell elongated, slightly convex, very inequilateral, anterior portion attenuated, rostrated, a little truncated and gaping at its extremity, nearly twice the length of the posterior portion, which is symmetrically rounded; closely covered with fine, concentric striæ and sulci, running parallel to the base; summits rather prominent, anterior dorsal area or lunule, lanceolate, well impressed, and carinated in the middle; superior anterior margin a little depressed or coarctated, so as to form two, light carinations extending from the beaks to the extremity; inferior or basal margin regularly rounded and entire; teeth 27 or 28, aculeated and very slightly recurvate; ligamentary fossa just before the summits, small, inclined anteriorly, angular at its superior and rounded in its inferior portions; ligament wholly internal; interior a pure brilliant white inclining to nacre; an elevated ridge extends from the beaks to the oval extremity, corresponding to the external depression: muscular impressions nearly imperceptible: epidermis an uniform sap green color, or light olive.

Observations. This species, which is very distinct, appears to be much rarer than the preceding, or is only found in a particular spot; as in several visits to Phillips' Beach, for the purpose of examining the fishes brought there by boats, in great numbers, I met with them but once, and then procured only four specimens. They must have been taken by the fishes, at no great distance from the shore, as they all contained the animal which was but very little decomposed. It somewhat resembles N. *costellâta*, Sow. from Panama, Conch. Illus. fig. 8.

TEREBRATULA SEPTENTRIONALIS.

T. testâ ob-ovatâ, tenui, albidâ, valvâ majore apud apicem coarctatâ, radiatim creberrimè striatâ, nate emarginatâ, foramine magno semi-elliptico, margine non inflexo, denticulato.

Long. eight twentieths, lat. four twentieths, alt. ten twentieths, of an inch.

Hab. coast of New England.

My own Cabinet.

Cabinet of Bost. Soc. Nat. History.

" of A. A. Gould, M. D.

Description. Shell obovate, thin, fragile, whitish, nearly diaphanous, with numerous fine, yet well marked, delicately granulate, radiating striæ, decussated by minute concentric ones; the larger valve is abruptly compressed near the apex, and feebly convex; summit emarginate, tendinal orifice large, semi-elliptical, completed by the minor valve, which is depressed, nearly flat and unguiform; margins without any inflexion, denticulate in their whole extent; the hinge is formed by two laminar cardinal teeth in each valve, those in the larger being the outermost, and in the smaller connected by a thin transverse plate, from each side of which arises a third narrow rib, which, curving a little inwards for about one third the length of the valve, there forms two branches diverging toward the middle of it, where they unite in such a manner as to form a slightly gibbous, oval ring about one eighth of an inch in diameter; the whole of this internal support is unconnected with the shell any where, save at the hinge. Viewed under a microscope, the valves exhibit a multitude of minute points or dots arranged in quincunx.

OBSERVATIONS. I am indebted for the specimen of this delicate shell, from which the foregoing description was made, to the kindness of W. W. Wheildon, Esq., of Charlestown, Mass., by whom it was taken from the stomach of a haddock, in deep water, off Nahant. I have been informed by Dr. A. A. Gould, that the same species was found, a year since, in Lubec Bay, by Dr. C. T. Jackson, during his geological survey of the State of Maine. It is therefore probably an inhabitant of deep water on the whole New England coast. I have seen in the possession of Dr. Jay, a specimen of this shell more than twice the size here given. Its color bordered more on the cinereous, and the valves were slightly elevated in the centre, from the apex to the margins. Locality unknown.

I was at first inclined to the belief, that the emarginate, open appearance of the tendinal orifice, was owing to the loss of the accessory pieces, which should have rendered it circular; but from subsequent examination of several other specimens which were perfectly fresh, and one of which had the animal still undecomposed in it, am now satisfied that it is a true character of the shell. So far as I can ascertain, there is no doubt this is an unedited species.

EOLIS BOSTONIENSIS.

Plate I. fig. 1.

E. corpore oblongo, capite brevi, tentaculis quatuor, branchiis cirriformibus, purpureis, apicibus albis, utrinque fasciculis quinis; pede amplo, posticè peracuto; tentacularum caudæque extremitatibus cyaneo tinctis.

Length thirty-one twentieths, expanded breadth of of foot seven twentieths of an inch.

Hab. Tide water of Charles River, Mass.

My own collection.

Cabinet of Bost. Soc. of Nat. History.

DESCRIPTION. Body oblong, posteriorly attenuated, rounded on the back, in about the centre of which is a slight protuberance, apparently covering the heart, and rising and falling with a regular pulsatory (qu. respiratory ?) movement; color a faint brownish white; head short, depressed, under side sub-orbicular, furnished with four tentaculæ, two of them lateral and frontal, smooth, of a lake color and beautifully tinged in the middle with azure; the other pair situate on the back of the head, of a dark flesh color, flattened and serrated at the sides and possessed of considerable contractility; the eyes, which are black and very minute, are placed laterally and posteriorly near their base; all the tentaculæ are quite long, and taper to a point; the mouth is large and fleshy, placed perpendicularly; lips thick, bright flesh colored, of an hemispherical form, with their convex portions contiguous; beneath the mouth and between that and the foot, are placed two labial or oral appendages, about one fourth of an inch in length, which are entirely separate from the foot and extend across and beyond it; the branchial cirri are round, their color purplish-brown tipped with white, arranged in five clusters on a side, 12 or 15 cirri in each, the middle clusters being rather the largest; foot somewhat broader than the body, its posterior extremity tapering gradually to a very fine point, and marked on the upper side with a bright azure line in the middle, about half an inch in length. Genital and anal orifices separate, upon the right side, the first just below and behind the anterior cluster of cirri, the latter near the back, between the third and fourth clusters.

EOLIS (Cavolina, Brug.) SALMONACEA.

Plate I. fig. 2.

E. corpore oblongo, capite lato, tentaculis quatuor, branchiis numerosis, salmonaceis, lineis longitudinalibus dorso dispositis, pede amplo, supra lacinulato, posticè acuto.

Length thirty-five twentieths, breadth of foot as expanded, sixteen twentieths of an inch.

Hab. same as preceding species.

Cab. Bost. Soc. Nat. History.

DESCRIPTION. Body oblong, tapering from the head, nearly diaphanous; color a pale, yellowish-white; back convex, with a conspicuous elevation in the middle, which exhibits a pulsatory or respiratory movement; the head is large, with two tentaculæ just above the jaws, and two on its upper part, the latter very minutely serrated at the sides; all four are much thicker and blunter than in the preceding species, and of a pale flesh color; the mouth is large, shaped like an inverted V; eyes imperceptible; branchial cirri dorsal, disposed in longitudinal lines to the number of one hundred or more, of a most beautiful salmon color bordering upon orange; they appear to consist each of an inner, round cirrus, which is sheathed in an outer one, the interval between the two being filled with a colorless fluid, rendering the external coat imperceptible except upon a close examination; their form is slightly convex on the back and front, flattened towards the sides and tubular at their extremities; the foot is broad and fleshy at the sides, but transparent in its middle portion, divided at its upper extremity so as to form a short, thick, tentaculiform appendage upon each side; its width continues undiminished till near the caudal extremity, when it is narrowed somewhat abruptly, and terminates in a short point. The genitalia are situate in a large tubercle upon the right side, a short distance behind the neck; the male organ is quite large and linguiform; the excretory duct is on the same side, near the middle of the body, and slightly prominent.

EOLIS (Tergipes, Cuv.) GYMNOTA.

Plate I. fig. 3.

E. corpore elongato, albido, capite brevi, orbiculato-depresso, tentaculis quatuor, branchiis fulvo-rufescentibus; utrinque fasciculis septem, medio dorsi nudo.

Length eighteen twentieths, breadth of expanded foot two twentieths of an inch.

Habit. same as preceding species.

My own collection.

Cabinet of Bost. Soc. Nat. History.

DESCRIPTION. Body elongated, slender, tapering gradually from head to tail; neck very distinct; head short, depressed, orbicular; mouth comparatively small, perpendicularly linear; tentaculæ four, the inferior pair situate laterally and superiorly on the front of the head, smooth, round, and about an eighth of an inch long, the superior pair, near the middle and back of the head, slightly compressed and minutely serrated at their sides, rather shorter than the frontal pairs; eyes inconspicuous; branchial cirri reddish-brown, disposed along each side of the back in seven clusters, rather remote from each other, each cluster formed of five cirri, the second and third pairs rather larger or longer than the rest; the middle of the back is entirely naked its whole length, and has the same elevation in its centre with those already described; foot the width of the body, entire and very transparent, the viscera showing very plainly through it; genital organs upon the right side below the first group of branchiæ; anal orifice somewhat higher up, between the third and fourth group same side.

OBSERVATIONS. The genus Eolis, Eolida or Eolidia, as it is variously denominated by authors, was separated together with the Tergipedes, by Cuvier, from the genus Doris of previous naturalists; from which Bruguière also established the genus Cavolina. Zoologists are, however, in the present state of knowledge, not of agreement whether the genera Tergipes and Cavolina should be definitively admitted or rejected. Among later authorities, De Blainville has given them a place in his "*Man. de Malac. et de Conchyl.*;" with the remark, that the latter, might, without inconvenience, be united to the Eolides; while Des Hayes, in his recent edition of Lamarck, advocates the unión of all three genera, or the considering them, at least for the present, as merely sections. Under these circumstances I have preferred placing the three species just described under one genus, and adopting the name of Eolis, originally given by Cuvier.

Of the organization of these animals, but little, comparatively speaking, is yet known. Lamarck, who probably never saw them alive, supposes that they are incapable of any locomotion except on the bottom, remarking, "*Les Eolides ne sauraient nager, et rampent seulement dans les fonds des mers.*" This however is incorrect, as I have frequently observed them swimming along with considerable speed, in an inverted position, near the surface; and found them almost invariably creeping about on the algæ &c., but a short distance below it. Their movements, generally, are much more rapid than those of the Tritoniæ.

In the description and figure of E. *Cuvièri* given by De Blainville, "*Man. de Mal. &c.*" p. 486, pl. 46, *bis*, fig. 8, 8ᵃ, the genital and anal orifices are placed nearly above each other; a position which is occupied by neither of them, in the species inhabiting our waters The difference of arrangement is so great indeed, in this respect, as almost to warrant our considering the latter as belonging to a distinct genus.

The branchiæ, usually so termed, are capable of erection and depression, simultaneously or individually, in a manner similar to the spines of the Echinus, and are constantly so in motion. Although I may be reproached with temerity, for venturing to dissent from the generally received opinion upon the subject, I would here express strong doubts, whether what are commonly denominated the branchiæ in these animals, do actually perform the office of respiratory organs, at least unassistedly. These doubts have arisen in my mind, in consequence of observing the facility with which the cirri are detached from the body, either when the animal is raised by them, or upon contact, by no means violent, with foreign bodies. I have repeatedly known these appendages to be almost entirely removed, and yet the animal live for several days. This was the case with the specimen of

E. *salmonàcea*, from which the drawing in the plate was made, which lived nearly a week, subsequent to being deprived of more than half the dorsal cirri. Individuals were, moreover, not unfrequently observed *in situ*, that had by some accident lost a portion of these organs. It is hardly probable that if they fulfilled the important vital functions ordinarily attributed to them, their loss could be sustained with such apparent impunity, or that they should be deranged or impaired from such trifling causes. If it be however actually the case, it must certainly be considered as at variance with all analogy. May not the organs of respiration themselves be internal, situate in the vicinity of the dorsal protuberance mentioned in the descriptions, and the cirri in some manner secondary or subservient to them? The pulsation observed in that region, usually at the rate of sixty-five to seventy strokes per minute, had much more the appearance of respiratory than arterial movement, being occasionally suspended for five or six seconds together, and recommencing apparently at the will of the animal. Such an occurrence could not well be accounted for, if the pulsations are referred to the motions of the heart; as the functions of that organ, being independent of volition, must, as in all other creatures, be performed with no other irregularity than that of occasional acceleration or retardation of the circulating fluid, produced by temporary disturbing causes. Unfortunately, at the time of observation, I was not in possession of any instruments sufficiently delicate for anatomical investigations of such animals; and after several clumsy trials with such as I had, was compelled to relinquish the attempt. I would beg leave to direct the attention of the Society to this interesting point, and to express the earnest hope that some of its members, who have leisure, will also find opportunity to investigate it fully.

I have a suspicion that the cirri in question assist in secreting the viscid substance, which is emitted in such quantities that the animal is sometimes completely enveloped in it, as the transparent fluid contained in their external tunic or sheath (alluded to in the description of *E. salmonàcea*), was found to be of a similar nature.

Nothing was ascertained in relation to their food, but from the fæcal matter being always semifluid and of a blackish or greenish color, it may be presumed that it is chiefly vegetable. Their ova are deposited in irregular, gelatinous envelopes upon the sticks, weeds, &c., in the vicinity of their habitat—the masses containing from one hundred ova each, to a thousand or more. The ova themselves are oblong, detached, and of a grayish white, the enveloping matter being perfectly transparent.

It is rather a singular fact, that although both the Eolides and Tritoniæ were so abundant last year, I have been unable to discover a single individual of either genus this season. Might they not have been accidentally introduced to our waters upon the bottoms of vessels, while in the ova? That foreign mollusca may be so introduced, we have evidence in the case of the United States ship Erie, which arrived in our port, the past autumn, from the coast of Brazil; bringing on her bottom great numbers of a variety of Mytilus *achatinus*, Lk. and a small species of Purpura, both of which I met with, some time after her repairs at the Navy Yard in Charlestown, adhering at low water to the piles outside the dry dock at that place. It is not impossible that the ova of the animals alluded to, may have been brought hither in a similar way. If they were naturally denizens of our vicinity, it seems very singular, both that they should have eluded the observation of our naturalists so long, and should now have entirely disappeared.

In dismissing this subject, I cannot but express my regret at being compelled to offer to the Society so much of hypothesis and so few facts relative to the habits and structure of these animals. The necessity of obeying (in Natural History especially) the "carpe diem" was never more fully illustrated than in the present case. My avocations, the lateness of the season (November) when I first met with the Eolis, and, as I then thought, the certainty of a more favorable time for examination on the ensuing spring, all combined to prevent my pursuing it farther at that season, and I have now only unavailing regrets left me that I did not persevere. I would again express the hope that some member of this Society will profit by my neglect, and complete what I have so imperfectly begun.

TRITONIA REYNOLDSII.

Plate II. figs. 1, 2, 3, 4.

T. corpore elongato, postice attenuato, papilloso seu verrucoso, rubro-fuscescente, maculis albidis notato; tentaculis duabus serratis, vaginulis lacinulatis retractilibus; branchiis arboreis, utrinque quinis, posticè gradatim minuentibus; ore corrugato, branchiis vel ramulis branchiiformibus senis instructo, papillisque numerosis circumdato.

Medium length three and a half inches.

Hab. tide waters of Charles River, Mass., at the Bathing House, Cragie's Bridge.

My own collection.

Cabinets of Bost. Soc. Nat. Hist., New York Lyceum Nat. Hist., John C. Jay, M. D., New York.

DESCRIPTION. Body elongated, rounded superiorly, very contractile, tapering gradually from the head to the tail, which terminates in a fine point, semi-transparent; color generally a rufous brown, the sides dotted with numerous wart-like excrescences or papillæ; in some individuals the color is dark brown, with large irregular patches of white on the back between the branchiæ; head short, depressed, orbicular, mouth in the form of a horse-shoe, full of strong transverse folds, surrounded by numerous papillæ, and furnished with three cervical branchiæ on each side, just above the lips; jaws angular and corneous. Tentaculæ two in number, serrated or rather transversely sulcate anteriorly, posteriorly compressed and smooth, contracting into a round sheath, which, arising from the back of the head, terminates in five unequal, ragged points, the middle or posterior one the longest. This sheath is also contractile in itself; a small, branchial appendage projects from its posterior side, near the base. The dorsal branchiæ are distributed in five distinct pairs, diminishing gradually in size from the first pair, and consist of numerous delicate ramifications, springing as it were from a single trunk. The animal has the power to withdraw these, when irritated, into its body, so that they appear merely like small tubercles or nodules. The foot is broad and white, and so diaphanous that the viscera and contents of the intestinal canal, the latter of a pale red color, are plainly discernible. Genital and anal orifices distinct and separate, on the right side; the former, between the tentaculæ and the first branchial tuft, is usually closed by a sub-conical, apron-like process, projecting backwards from its anterior portion, and nearly concealing the whole orifice; the male organ is filiform, white and frequently protruded from beneath this cover. Anal orifice slightly tubular, situated near the back, between the first and second pair of branchiæ.

Observations. Of the genus Tritonia, separated by Cuvier from the confused genus Doris of previous authors, but four or five species were known to him. It has subsequently been adopted by all zoologists, and the number of well established species, augmented to about a dozen. Of these, three are from the Red Sea, and the remainder are found in the North Sea and British Channel. Those inhabiting the Red Sea are eminently distinguished from our native species, by having from ten to twelve, in lieu of five pair of dorsal branchiæ; and, of the rest, one only appears to possess any considerable resemblance to it, which is the *T. arboréscens*, Cuvier.

The number of dorsal branchiæ is the same in both; and the figure given by Cuvier himself, *Ann. du Mus.*, t. vi. pl. 61, fig. 8, 9, 10, has very much the appearance of ours when preserved in spirits. He makes no mention of color, and from his figure and description, we may infer that his observations were made upon specimens in that condition. He describes it as "*T. corpore oblongo, tumido,* branchiis ramosis distinctis, utrinque quinis, posterioribus sensim minoribus, *ore quadri-lamelloso.*" Now "*corpore oblongo, tumido,*" is an accurate description of our species when observed in spirits, but cannot with any propriety be applied to the *living* animal, as may readily be perceived upon a comparison of the specimens in the Society's Cabinet with the plates. It is probable, therefore, if it were in our power to examine a living individual of T. *arboréscens*, it would be found in its general aspect very closely allied to our own species. My principal reason for considering the latter as new, is the last clause of Cuvier's description, "*ore quadri-lamelloso.*" These lamellæ are figured as two tufted projections on each side of the head, which are doubtless cervical branchiæ, contracted by the spirits. Ours, however, has *three* of these appendages on each side, and we must consequently either suppose the illustrious naturalist, who dissected the animal with great care, to have been singularly negligent in this peculiar portion of its organization, or consider ours to be a distinct species. This may be the more safely assumed, as he observes the plates were drawn by himself, with the express intention of having, what did not previously exist, a figure of the animal which could be relied on for the accuracy of its details.

Lamarck, in his generic description, states that the Tritoniæ have two eyes, without however, mentioning their position. For more than two months, with upward of one hundred specimens for examination, I vainly attempted to discover these organs; unless two whitish points at the extremity of the tentaculæ are to be considered as such, which, to say the least, is very doubtful. Rang, who usually observes very closely, makes no allusion to the eyes of this animal, in his, "*Manuel des Mollusques;*" and my own observations induce a belief that they are deficient, and their place supplied by the delicately constructed respiratory apparatus, which unquestionably fulfils the double office of branchiæ and tentaculæ. I have frequently held my finger within a quarter of an inch of them while crawling about, yet never produced any of that alarm, which most creatures endowed with sight exhibit, at such proximity of a strange body; while at the slightest contact, they contracted their whole body, folded the foot together and sunk as if lifeless to the bottom.

Their locomotion is extremely slow, and is performed by successive contractions and extensions of the body. Their progress is marked by a thick viscid substance, which is emitted in great quantities. In changing their position, they extend the branchiæ and tentacula in all directions, and if any obstacle is encountered, contract them again very suddenly. If the irritating cause continues, the branchiæ are frequently withdrawn, as it were into the body, so as to render them nearly invisible, and their reappearance is very gradual. If the animal is left undisturbed, it glides along a short distance and repeats the experiment. This happens upon uniform surfaces; but in proceeding from one bunch of weed to another, they relinquish their hold by degrees, folding the foot together as they do so, till they remain attached only by a small portion posteriorly, when they reach out in every direction till a new support is encountered, which they embrace and then surrender the old one. This procedure is exceedingly slow, it frequently occupying them ten minutes or more to move half as many inches.

Like the animal of Lymnæa and some other genera, the Tritoniæ possess the faculty of moving along the surface of the water in an inverted position ; in doing which the branchiæ appear to be used for the purpose of assisting their natation. Upon touching one of them, while crawling about in this manner, it was perceived that the surface of the water, above its foot, was coated with the viscid substance emitted by the animal, by means of which it formed a sort of air vessel between its foot and the surface, thereby enabling it to suspend itself in this singular manner. That this was the mode of effecting its purpose, was evident from the creature's sinking instantly to the bottom, upon this coating being penetrated.

The Tritoniæ seem to be very sensitive to the various conditions of the atmosphere. During dry or windy seasons but few were observed near the surface, and these quite inert; but in moist weather, and particularly after a shower, scores of them were seen at the depth of from one inch to two or three feet, creeping among the Tubularia and algæ that fringed the side of the bathing-house where they were discovered. A strong light also appears to act upon them very powerfully. On bringing the glass jar, in which they were placed, near a lamp in the evening, if it were done suddenly, they fell instantly to the bottom, writhing about with great activity and in a manner leaping towards the surface. The same effect was produced if they were abruptly removed from a darkened room into a strong sunlight.

The nature of their food could not be determined with any certainty; but from the structure of their oral apparatus, as well as the fæcal matter being always discharged in hard pellets of a bright red color, I should infer that it consists chiefly of the minute crustacea abounding in the water where they dwelt. Every thing of a fleshy nature thrown into the jar with them, was left untouched.

I have great pleasure in naming this beautiful species in honor of my friend, J. N. Reynolds, Esq. whose arduous labors in another field, do not impair his interest in natural science, as his donations, recorded in the recent catalogue of our Society clearly evince.

The specimen from which the drawing in the plate was made, was one of the largest met with. The coloration differed but little in different individuals, with the exception of what appeared to border upon a constant variety—a broad white irregular spot on the back between each pair of branchiæ, which, in a few instances, extended the whole of its length. The proportion of individuals thus marked was nearly as one to four. The only difference noted in the others was that of a deeper or lighter shade of brown.

CHITON FULMINATUS.

C. testâ oblongo-ovali, anticè sub-attenuatâ, plerumque rufo-flavescente aut virescente, lineis albis angulatis et flammulatis pictâ; valvis sub-carinatis, minutissimè granulatis, marginibus posterioribus albo punctatis, areis lateralibus indistinctis; margine pubescente, rufescente, albo maculato.

Long. fourteen twentieths, lat. nine twentieths of an inch.

Hab. waters of Mass. Bay.

My own Cabinet.

Cabinets of Bost. Soc. Nat. Hist., A. A. Gould, M. D., John C. Jay, M. D., (N. Y.)

DESCRIPTION. Shell oblong-oval, slightly narrowed and depressed anteriorly, color varying in different specimens from clear, to yellowish or greenish and sometimes even blackish red, with numerous zigzag white lines upon the terminal valves, and zigzag undulating or flammulate markings of the same color thickly arranged over the rest of the valve; valves sub-carinate, covered with microscopic granulations, disposed in quincunx, and giving the shell, under a lens of moderate power, a resemblance to shagreen; posterior edge of the valves marked with three or four white dots on each side; increment indicated by very apparent concentric striæ, which occasionally form even slight ridges; lateral areas in some specimens quite distinct, in others almost imperceptible; margin narrow, coriaceous, coated with a close, short, reddish down, irregularly banded with white; terminal valves semilunate; laminæ of insertion crenated and denticulated, lateral bipartite; connecting ones entire: internally, white at the insertion and sides of the valves, deepening towards the middle to a beautiful rose color.

OBSERVATIONS. This elegant species, which if equalled, is certainly unsurpassed, in the beauty of its marking and variety of its coloration, by any of the genus, yet described, was first found by me in the stomachs of fishes, taken near Cohasset rocks; subsequently, considerable numbers were procured from the same source, in the vicinity of Cape Ann; and a single living specimen was obtained from the rocks on the northeast part of Nahant, at low water in July last.

The only species I know of, bearing much resemblance to this, are C. *marmoràtus*, and C. *ruber*, LIN. The first is described as black, or greenish, or deep red brown, on a lighter ground, and thus far has considerable agreement with ours; but the margin is said to be scaly, which it is not in ours, and the internal color is greenish, in lieu of rose color. The second is described as having the back carinate, color an uniform red, sometimes a darker streak, on the back, marbled red and white, one inch long; inhabits North Sea; but the remarkable angular lines in our species, are too conspicuous in all the varieties, to admit of a doubt of its being distinct enough from this, notwithstanding their similarity in some respects. Unfortunately, the figure of C. *ruber* in Chemnitz is not accessible; and nothing is said in the description, of the nature of the margin.

C. *punctàtus*, Lin. with which some of the naturalists, in this city, have supposed ours might be identical, is described simply as "C. *testâ octovalvâ lævi, corpore punctis excavatis*," but besides this being, at best, a very unsatisfactory description, ours differs essentially in having the points *elevatis*, instead of "*excavatis*."

I have given the largest average size, but single valves and fragments were met with, indicating a shell considerably larger than any found entire.

CHITON SAGRINATUS.

C. testâ parvulà, elongato-ovali, nigricante; valvis sub-carinatis, tenuissimè et concentricè striatis, minutissimè sagrinatis; areis lateralibus indistinctis; valvis terminalibus semilunatis; margine granulato.

Long. eight twentieths, lat. three twentieths, of an inch.

Hab. waters of Mass. Bay.

My own Cabinet.

Cabinets of Bos. Soc. Nat. Hist., A. A. Gould, M. D., Boston, John C. Jay, M. D. (N. Y.)

Description. Shell small, elongated oval, covered with a fine, blackish, farinaceous substance, which is easily rubbed off, and leaves the (prevailing) color ashy, but in some specimens a blackish red; valves sub-carinate, with numerous, delicate, concentric striæ, exhibiting, under the microscope, a beautifully regular granulation, resembling the finest shagreen; lateral areas sometimes slightly defined on the three anterior valves, by a feeble ridge, extending from the apices to their posterior margin, but for the most part, without any distinct boundary; valves without any projecting laminæ, or denticulations, at their insertions, but minutely crenulated on their interior margin ; terminal valves semilunate, margin membranous, ash colored, covered with fine granulæ, and having a narrow, black line, surrounding it in the middle ; internal color a dull white.

OBSERVATIONS. This species was obtained from the stomachs of fishes, in various parts of our outer Bay, between Cohasset rocks and Cape Ann.

It is much smaller than the preceding species, and apparently not quite so common. The granose margin prevents its ever being confounded with that, although in other respects, they sometimes are considerably alike. But few specimens, even in tolerably perfect condition, were met with, as the farinaceous substance coating the shell, was very easily rubbed off, in which state, the granulated appearance of the valves is much more conspicuous than when perfect.

The only species I am aware of, having much analogy to this, is C. *minimus*, LIN., described by him as "smooth, black, sprinkled with meal in patches, half an inch long," inhabiting the seas of Norway, and figured by Chemnitz, vol. 8, pl. 96, fig. 814.

CHITON EMERSONII.

Plate III. fig. 10.

C. testâ ovali, anticè paulum compressâ, albidâ, membranâ squalidâ pubescente tectâ, valvis posticè arcuatis, lateribus rotundatis, areis centralibus cordiformibus et granulatis, valvâ anticâ divaricatim lineatâ, posticâ emarginatâ et valdè arcuatâ ; valvis intermediis, lineâ bicarinatâ ab apice ad latus posticum obliquè decurrente ; margine fasciculis crinitis, ordinibus binis dispositis.

Long. sixteen twentieths, lat. ten twentieths, of an inch.

Hab. waters of Mass. Bay.

My own Cabinet, and that of the Bost. Soc.Nat. Hist., Geo. B. Emerson Esq., and A. A. Gould, M. D.

Description. Shell oval, convex, somewhat compressed anteriorly; color a dull ashy white, nearly covered by a thin pergamineous integument, apparently formed by an extraordinary prolongation of the coriaceous margin, and coated with a thick, short, dirty-blackish pubescence; valves posteriorly arcuated, laterally rounded, not angular in any part, sub-carinate, their apices slightly produced; in the centre of each is a cordiform elevation, formed by very delicate, concentric, granulate lines, five or six in number, and occupying rather more than one fifth of their breadth; lateral areas defined by a feebly elevated line, usually rendered bicarinate by a suture or sulcation in its middle, and extending obliquely and posteriorly from the apices to the margins, where the suture deepens into a slight fissure; terminal valves entire, without either laminæ or denticulations at their insertion; anterior one marked with elevated radiating lines; posterior, disproportionately smaller than the rest, emarginate and strongly arcuated or scooped out at its extremity; intermediate valves, except in the centre, quite smooth; margin coriaceous, having the same external downy coating as the rest of the shell, and surrounded by two parallel ranges of fasciculi, composed of shining yellowish hairs, about an eighth of an inch in length, situated one above the other, to the number of two on each of the intermediate, and six or eight round the terminal valves; internal color a dead white.

Observations. This remarkable species was obtained, like the preceding, from the stomachs of cod, taken in the neighborhood of Cape Ann. I know of none analogous except C. *crinitus*, PENN., C. *tunicàtus*, WOOD, *Gen. Conch.*, and C. *vestitus*, BROD. and SOW., *Zool. Jour. III.* 368. The first of these has long been considered rather doubtful, having been seen by no person but Pennant himself, who briefly describes it as " C. with 7 valves, thick set with short hairs, five eighths of an inch long." The figure given by him, *Brit. Zool. vol.* IV, pl. 36. fig. 1, has but little resemblance to our species and is referred by Des Hayes, in his late edition of Lamarck, to C. *fasciculàris*, LIN.

C. *tunicàtus*, WOOD, has considerable likeness to ours, when the latter has lost the downy coating of the integument, but it is more than five times its size, and without its elevated central area. C. *vestìtus*, BROD. and SOW. is described by them as " C. valvis reniformibus, membranâ coriaceâ vestitis, apicibus nudis. Long. sixteen tenths, lat. nine tenths of an inch. Hab. Oceano Arctico." In their observations they remark, " the rather elevated points of the valves are alone visible, but when the coriaceous membrane which covers them is dry, their edges are easily traced. Little bunches of brownish hairs are scattered over the surface." I feel persuaded that this is distinct from our species, from the circumstance that neither the peculiar cordiform granulation in the centre of the valves, nor the equally singular emargination of the posterior one, are alluded to by the describers. It is difficult to believe, that if these remarkable characters had existed in C. *vestitus*, they would have escaped the notice of such observers. Where they speak of the edges being " easily traced," it is evidently those of the valves, and not of their " rather elevated points," to which they refer. It may also be observed, *en passant*, that C. *vestitus*, is full twice the size of our shell.

The first specimen obtained was considerably macerated, and in that condition, the external coat being lost, and the central areas only, conspicuous, had very much the aspect of a Chitonellus. It evidently forms one of the connecting links between the two genera. The elastic integument with which it is covered, and the rounded form of the valves, must render the shell much more flexible and consequently afford the animal far greater freedom of motion, especially in turning, than is possessed by the generality of Chitons.

No single specimen was procured, entirely perfect, but as the deficiencies existing in some were supplied by others, the description may be relied upon for accuracy. Indeed a description from a perfect specimen alone, would, from the peculiar organization of the shell, be very imperfect, many of the characters being only visible when the external coating is effaced, as was the case with most of my specimens.

I have named this singular species in honor of George B. Emerson, Esq., President of the Boston Society of Natural History, as a token of affectionate remembrance on the part of his former pupil.

PATELLA CANDIDA.

P. testà parvulà, ovali, sub-diaphanà, candidà, concentricè striatâ, costis scabris, exiguis, radiantibus; intùs nitidâ.

Long. seven twentieths, lat. four twentieths, alt. two twentieths, of an inch.

Habitat Mass. Bay.

Cabinet of Bost. Soc. Nat. History.

Description. Shell small, thin, oval, moderately convex, semi-transparent, exterior of an uniform pure white, having numerous, minute, radiating ribs, traversed by equally fine concentric striations, which render them slightly scabrous, and give the whole surface, when viewed under a lens, a reticulated or clathrate appearance, similar to that of certain Fissurellæ; summit subcentral, margin feebly crenulated by the termination of the costæ; internal color a brilliant white.

OBSERVATIONS. This beautiful little shell, which, by its coloration and the curious reticulation it exhibits when examined with a microscope, is very distinct from any known Patella, was procured from a cod caught abreast of Barnstable, last July. Only a single specimen was met with, which has the appearance of being yet immature. There can be no question, however, that the characters exhibited by it, would be still more conspicuous in the adult stage.

RIMULA NOACHINA, Lin.

Synonyms and References.

Patèlla Noachìna, LIN. *Lin. Mant. p.* 551.
 apertùra, MONT. *Test. Brit. pl.* 13, *fig.* 10.
 fissurèlla, GMEL. *p.* 3728, *no.* 193.
Fissurèlla Noachìna, LYELL, *Des Hayes contin. of Lamarck—ed.* 1836, *no.* 30.
Sipho radiàta, BROWN, *Illus. Conch. British Islands, pl.* 36, *fig.* 20.

This singular little shell, upon which hardly any two authors appear to agree, as to genus and species, was taken from the entrails of fishes caught in the vicinity of Cohasset rocks. Des Hayes, in his continuation of Lamarck, places it at the end of his Fissurellæ, with the remark, that it will probably hereafter serve as the type for the genus Rimula of Defrance, which is based upon a fossil species. I have therefore decided on so placing it, and restoring the specific name originally bestowed upon it by Linnæus, instead of adopting the nomenclature of Brown, who, not content with instituting a new genus for it, has also affixed a specific appellation of his own, far less descriptive than its rightful one.

BULLA TRITICEA.

Plate II. Fig. 8.

B. Testâ parvulâ, cylindricâ, albidâ, nitidâ, epidermide ferruginea tectâ; spirâ depressiusculâ, imperforatâ; columellâ basi sinuosâ, leviter reflexâ, albâ.

Long. eleven fortieths, diameter three fortieths, of an inch.

Habitat waters of Mass. Bay.

My own Collection.

Cabinets of Bost. Soc. Nat. Hist., and A. A. Gould.

DESCRIPTION. Shell polished, cylindrical, rather solid, color a dull white, covered with a thin, shining, ferruginous epidermis; spire slightly depressed, imperforate; body traversed longitudinally and transversely by numerous microscopic striæ; lip inserted into, or arising from the spire; aperture narrow, almost linear, except the base, where it is dilated to twice its previous width by the sudden curvature of the columella, which is white, and slightly reflected upon the body of the shell.

Observations. Several specimens of this little shell were obtained, during the last summer, from various parts of our outer bay. In its general outline it corresponds so closely with B. *cylindràcea*, Penn., as described by Des Hayes in his recent edition of Lamarck, that, were it not for the perforation of the spire in that species, which does not exist in this, the same description would answer equally well for both shells.

B. *árachis*, Quoy, found at Port George, New Holland, has also many traits of resemblance to our species, but differs from it, like the preceding, in having the spire umbilicate. I am not aware of any other described species, which could be confounded with this.

Natica consolidata.

N. testâ subglobosâ, lævi, rufescente, interdum albidâ; spirâ brevissimâ; umbilico parvo, consolidato; aperturâ ovatâ, operculo calcareo, lævi; epidermide fusco-virescente.

Diam. of axis ten twentieths, of basis eleven twentieths of an inch.

Habit. coast of New England.

My own Collection.

Cabinets of Bost. Soc. Nat. History, A. A. Gould, and N. Y. Lyc. Nat. History.

Description. Shell smooth, sub-globose, color varying from dull white, to dark red or brown; (when of the latter, a whitish zone always encircles the base), covered with a thin, greenish-brown epidermis; whorls four or five, with numerous, minute, incremental striæ; superior portion of the body-whorl depressed and sometimes slightly concave, sutural line distinct, spire very short and flattened, aperture oval, outer lip tranchant at superior edge, thickened and rounded towards the base, callus depressed, reflected upon and filling the umbilicus, which is very small, and in mature specimens entirely concealed, so as to give the shell the aspect of being imperforate. Internal color a fine white; operculum calcareous, smooth and white, with transverse microscopic striæ.

Observations. This shell was taken in great numbers, from fishes caught near Nahant, and a few small specimens, off Cohasset. It doubtless exists, in deep water, in all parts of our outer bay, and may probably be found along the whole coast of New England. Its bony operculum, and the entire consolidation of the umbilicus, distinguish it from any of our known species of Natica. It may possibly be an inhabitant of the western coast of Great Britain, and have been noticed by some of the earlier English writers as a Turbo. I have not, however, been able to find any such description.

Several of the specimens of this shell, taken from the fishes, crawled about upon being placed in clear water; proving that they must have been swallowed very recently, and of course not far from our shores.

Oxinoe ? glabra.

O. testâ ovali, parvâ, ventricosâ, sub-umbilicatâ, albâ, fragili, spirâ brevi, laterali, labro integro, columellâ arcuatâ, aperturâ valdé effusâ.

Diam. of axis six twentieths, transverse diam. eight twentieths of an inch.

Habitat Mass. Bay.

Cabinet of Bost. Soc. Nat. History.

Description. Shell small, oval, ventricose, thin, diaphanous, smooth, white and shining; spire very short, lateral, and visible internally; volutions two, the last forming almost the entire surface of the shell; incremental striæ very minute and numerous; lip sharp and smooth, somewhat everted at its inferior junction with the columella, which is elevated, strongly arcuated and formed by a thickening and reduplication of the inner lip; near the superior extremity of the columella, a thin, vitreous deposit extending over it upon the body of the shell, forms a slight umbilicus; aperture oval, effuse, occupying nearly the whole inferior portion of the shell.

Observations. The aspect of this shell corresponds almost precisely with the figures of *Sigarètus haliotoidèus*, Lk., given by Montague, Turton and Brown, in their works upon British shells. There can, however, be no doubt of its being distinct, from the fact that the animal, as observed by me, was wholly internal, with a muscular, oblong disk or foot like a Patella, and two short, thick tentaculæ; in its contracted state barely filling the shell, from which it was easily detached. From Velutina it is removed by being furnished with a distinct columella, the absence of which is made by Blainville, its founder, one of the characteristic marks of that genus. From Rafinesque's description of his genus Oxinoe, it appears to me the most appropriate one in which to place this shell for the present; hoping that an opportunity may hereafter occur to examine it with the animal perfect. This latter, which, although the characters above specified were distinct enough, was still much injured by partial decomposition in the stomach of the fish whence it was taken. The fish itself was caught off Barnstable, in the month of July last.

JAMINIA EXIGUA.

Plate II. fig. 7.

J. testâ parvulâ, conicâ, albido-pellucidâ; anfractibus convexis; suturis impressis; aperturâ ovali; basi effusâ; columellâ reflexâ, uniplicatâ; epidermide fuscescente.

Long. seven fortieths, diam. of basis three fortieths, of an inch.

Habitat Boston Harbor.

My own Collection and that of the Society.

DESCRIPTION. Shell conical, rather elongated, imperforate; apex a little obtuse, diaphanous; color a bluish white, under a brownish membranous epidermis; volutions five to six, convex, the inferior one somewhat ventricose, and constituting about half the entire length of the shell; sutures strongly impressed, a single, faint, revolving line, is sometimes visible just below them; incremental striæ microscopic, numerous, and regular, imperceptible until the epidermis is removed; aperture regularly oval; base somewhat effuse; outer lip sharp, smooth, without sinus at the juncture, and rendered slightly angular superiorly, by a depression of the upper portion of the body-whorl; columella white, shining, reflected in such a manner as occasionally to give the shell the aspect of being sub-perforate, furnished with a single, prominent oblique tooth or fold near its middle; operculum corneous.

OBSERVATIONS. Found at Chelsea, near the ferry landing, adhering to the decaying wood and fucus. It has considerable resemblance to *Actæon trifidus*, TOTTEN, which evidently belongs to the same genus. Indeed one of the species figured by Brown, (*J. pullus*, Brown, *Conch. pl.* 50, *fig.* 11,) appears almost identical with Col. Totten's shell. Brown represents ten species of this genus, with which, it may be presumed, Col. T. was unacquainted, at the time his description was given, from his remarking that he was at a loss where to place the shell, and considering it, rather provisionally, as an Actæon. Our species may easily be distinguished from his, by its less conical form, the whorls being much more convex, and the lower one more ventricose, besides its being destitute of the distinct, triple, revolving lines, characteristic of *A. trifidus.* It does not appear to be uncommon, and has probably escaped earlier notice only from its habits of concealment, and its diminutive size.

SCALARIA SUBULATA.

Plate III. fig. 4.

An. corpore spirali, griseo, albo-maculato; pede brevi, crasso, oblongo; tentaculis duabus; oculis parvulis, nigris; ore orbiculato, corrugato; proboscide nullâ; operculo corneo.

Sc. testâ acuto-turritâ, obscuro-albidâ, interdùm fuscescente, imperforatâ; anfractibus sub-convexis, contiguis; costis sub-æqualibus, depressis, supernè angulatis; aperturâ ovali; labro basi emarginato, intùs albo.

Long. seventeen twentieths, diam. of basis six twentieths, of an inch.

Hab. Mass. Bay, vicinity of Cape Ann.

My own Collection.

Cabinet of Bost. Soc. Nat. Hist. and of N. Y. Lyceum of Nat. History.

Description. Animal with the body spiral, of a yellowish-gray, thickly and irregularly marked with dull, whitish spots, which are most conspicuous upon the sides of the neck; foot short, thick, and muscular, oblong, and when wholly expanded, appearing nearly quadrangular; head elongated, rounded superiorly, not separated from the neck by any distinct line; from its superior, posterior sides arise two tentaculæ about one eighth of an inch in length, terminating in a fine point, but destitute of the bristly process, "*filet sétacé,*" mentioned by Lamarck in his generic description of Scalaria. The eyes are small, black and shining, situate laterally and posteriorly at the base of the tentaculæ, and not as in the animal described by Lamarck and Blainville, near their middle; mouth rather large, rounded, and externally furnished with numerous strong folds or wrinkles; no proboscis was at any time protruded; the operculum is horny, strong, opaque, shining and pauci-spiral.

Shell turreted, tapering to an acute point, imperforate, opaque, color varying from dull bluish to brownish white; whorls nine, contiguous, slightly convex, traversed longitudinally by strong, equidistant, compressed, nearly regular ribs, of a whiter color than the rest of the shell, to the number of ten on the body-whorl, which is circled at its base, by an angular line commencing at the superior portion of the columella, and running parallel to the sutures. The ribs do not terminate at the sutures, but extend each one upon that next above it, in such a way as to render the summit of each somewhat angular; the interstices of the costæ are strongly impressed with seven or eight revolving striæ; aperture regularly oval, lip bordered externally by a strong rib, slightly emarginate at the base, rounded and slightly reflected in its columellar portion, and internally of a pure white.

Observations. The only species of Scalaria, for which the present could possibly be mistaken, is S. *Turtònis*, Turt., but that much exceeds it in size;—it differs also in the number of whorls, which, instead of nine, vary from twelve to sixteen, and the lip is without the basal emargination exhibited by ours. An imperfect shell, from the Grand Bank, and now in the cabinet of Dr. A. A. Gould, of Boston, answers very exactly the descriptions of S. *Turtònis*, but differs materially from this shell.

I have found, in several visits to the neighborhood of Cape Ann, five specimens in all, among which, I was so fortunate as to discover one containing the animal. This individual was picked up from a mass of entrails in a state of partial decomposition, found so high upon the beach, as to preclude almost a possibility of its being there, through its own agency, even if the shell had not, by its appearance, furnished incontestable evidence of its having been in the stomach of the fish.

Upon my return from the excursion, it was, with a number of other shells from the same locality, thrown into a basin of fresh water, in order to cleanse it from the filth with which it was covered, where it remained for eighteen hours. On turning off the water, I perceived the animal slightly protruded, but had no idea of its being alive, until I took it up, and, to my surprise, beheld it slowly withdraw into the shell. It was immediately placed in a vessel of sea water, where it continued alive for several weeks. It fed quite eagerly upon fresh beef, which was thrown in, especially when it had become somewhat macerated. It was very sluggish in its motions, frequently remaining an hour or more, on the same spot, with its body protruded just beyond the tentaculæ, which it kept continually in motion. The least touch, however, or agitation of the vessel, caused it to withdraw with great rapidity into its shell.

When the great solvent power of the gastric juice in fishes is considered, the tenacity of life, to which I owe the opportunity of making observations upon this animal, may be regarded as truly wonderful.

It was my intention to have procured a drawing of the animal, and subsequently made a dissection of it; but having been suddenly called out of the city for several weeks, it unfortunately perished before my return, for want of proper attention, and I am able, in consequence, only to give such notes of its external appearance, as were made previous to my absence. I am not aware that any complete, anatomical description of this animal has ever been given, and should hope that the knowledge of its dwelling on our coast, may induce some of our naturalists to search for it, and to furnish a full detail of its organization.

SCALARIA NOVANGLI.

Plate III. fig. 5.

S. testà elongato-turritâ, sub-perforatâ, albà, maculis fuscescentibus notatâ; costis parvulis, inæqualibus, interstitiis tenuissimè striatis; anfractibus convexis, vix contiguis; aperturà ovatà; labro integro.

Long. fourteen twentieths, diam. of basis five twentienths, of an inch.

Hab. deep water of Mass. Bay.

My collection.

DESCRIPTION. Shell turreted, elongate, slightly perforate, of a shining white color, with irregular brownish spots which are largest on the two lower whorls; whorls ten in number, very convex, barely touching each other; crossed by numerous, delicate, slightly elevated, polished ribs, to the number of eleven on the body-whorl, each forming at its superior portion a distinct mucronation. The rib bounding the lip, and several others upon the last three whorls are much more robust than the rest. The interstices of the costæ are covered with numerous, fine, raised striæ, whose intervals are filled with others still finer, and which are traversed by exceedingly close and minute longitudinal lines, giving the shell, under a microscope, a very beautiful reticulated aspect. Aperture ovate, lip continuous, formed by a robust rib having a spinous projection or aculeation upon its outer superior portion, flattened and produced into an angle at its inferior columellar extremity, so as partially to conceal the umbilicus.

OBSERVATIONS. This elegant shell, the most beautiful, perhaps, of all that are found on our coast, has a general resemblance to S. *multistriàta* of Say, but differs from that shell, in the number and irregularity of the costæ, as well as in having their summits mucronate or crowned, and also in being perforate, which is not the case with Say's shell. S. *lineàta* of Say, has also some resemblance to this, but wants the interstitial striæ, and has, moreover, a slightly elevated line surrounding the base, which is not found in our species. S. *clathrus*, Mont., is also distinct, in having the intervals of the costæ perfectly smooth, in its ribs traversing the sutures, and in its being imperforate. I have met with but one specimen, taken from the stomach of a cod, off Cape Ann, in August last; but this is fortunately perfect, and in a high state of preservation.

TURBO INCARNATUS.

T. testà sub-conicâ, rubrâ, anfractibus convexis, transversim creberrimè striatis; basi convexà, latè profundèque perforatâ; labro tenui, lævi, intùs fulgido; operculo corneo.

Diameter of axis seven twentieths, of basis eight twentieths of an inch.

Habit. vicinity of Phillips's Beach, Mass.

My own Collection.

Cabinets of Bost. Soc. Nat. Hist.; A. A. Gould, M. D., Boston; John C. Jay, M. D., New York.

DESCRIPTION. Shell sub-conical, thin, shining; color an uniform dark red; whorls four or five, convex, impressed with numerous, fine, but well marked striæ, alternating with others still finer, the upper portion of the body-whorl frequently rugose; sutures strongly defined, base convex, basal striæ much finer than those of the whorls; umbilicus large and profound, extending quite to the apex; aperture nearly circular, lip sharp, dilated, projecting at its juncture a little beyond the inferior or columellar portion, which is in some specimens continuous; interior perlaceous, resplendent; operculum thin, horny, multi-spiral.

OBSERVATIONS. This beautiful shell, which has more the aspect of a tropical than a northern species, was first found by me, in considerable numbers, in the stomachs of cod and other large fish, taken between Marblehead and Nahant. On a subsequent visit to Phillips's Beach, I found it alive, upon the shore. Its form and character are very constant, except that in some specimens the rugose appearance of the upper margin of the body-whorl is hardly perceptible, and the young shells are occasionally rather more depressed. Beneath the nacre of the interior, which is beautifully iridescent, the external color is visible. I do not feel certain that this is not T. *cárneus* of Lowe, figured Zool. Jour. pl. V. figs. 12, 13, 13 b; but incline to the belief that it is a distinct species. Lowe's shell appears more conical or pyramidal in shape than ours.

TURBO CINEREUS.

Plate III. Fig. 9.

T. testâ pyramidali, tenui, cinereâ; anfractibus convexiusculis, costellis numerosis cinctis, longitudinaliter tenuissimè striatis; basi subconvexâ, perforatâ; labro tenui, crenulato; intus margaritaceâ; operculo corneo.

Diam. of axis nine twentieths, of basis eight twentieths of an inch.

Hab. deep water, vicinity of Cape Ann, Mass.

My own Collection.

Cabinets of Bost. Soc. Nat. Hist.; New York Lyceum; John C. Jay, M. D., New York.

DESCRIPTION. Shell conical or pyramidal, thin, uniform ash color, whorls slightly convex, varying from five to seven; sutures distinctly marked; the lower whorl has four and sometimes five or six, revolving, elevated striæ or small ribs, which diminish in number as they approach the apex; the most central of these is the largest, and gives rather a carinated aspect to the middle portion of the whorls. The shell is longitudinally traversed by closely set, delicate, sub-laminar, oblique striæ, not interrupted by the costæ, and giving two or three of the apicial whorls something of a nodulous or gemmulated appearance. Base slightly convex, with transverse and concentric striæ, like the whorls, and perforated about half the length of the shell. Aperture circular, slightly angulated by the junction of the outer lip, which is crenulated by the termination of the striæ and slightly reflected in its columellar portion, so as to conceal a small part of the umbilicus, in adult specimens. Interior pearly; operculum horny, transparent and multi-spiral.

Observations. This species, like the preceding, was found in the stomachs of fishes taken off Lynn, and dead specimens were met with on Phillips's Beach. It is a strongly marked shell, and symmetrical in its appearance; but its dull color renders it much less attractive than T. *incarnàtus*. It appears to be rather less common than that species, which was found in the proportion of three to one of this.

Turbo obscurus.

T. testâ subconicâ, perforatâ, fusco-rubente; anfractibus convexis, supernè leviter angulatis; basi convexâ, aperturâ rotundâ, labro tenui, lævi, intùs iridescente; operculo corneo.

Diam. of axis five twentieths, of basis seven twentieths of an inch.

Hab. Coast of New England, in waters of Mass. Bay.

My own Collection.

Cabinets of Bost. Soc. Nat. Hist.; A. A. Gould, M. D., Boston; Lyceum of Nat. Hist., New York.

Description. Shell sub-conical, thin, color an obscure reddish brown, whorls five in number, convex, traversed by numerous, very minute, revolving striæ, intersected by almost imperceptible longitudinal ones; a single slightly elevated line or rib revolves a short distance below the sutures, which are tolerably well defined; base convex, concentric basal striæ scarcely perceptible, transverse striæ very apparent; umbilicus moderately wide and extending nearly to the apex; aperture circular, lip sharp, smooth internally, and slightly reflected upon the umbilicus. Interior iridescent; operculum thin, horny, concentrically spiral.

OBSERVATIONS. This shell has considerable affinity to T. *cinèreus*, but differs in being much less pyramidal in form, and in having a less turreted aspect, and is entirely destitute of the strongly marked costæ, which are so prominent on that species. The revolving or concentric basal striæ, instead of being, as in that, most apparent, are nearly imperceptible. It is altogether a much smoother and heavier shell, the color is entirely different, and its whole appearance renders it easily distinguishable from either of the preceding species.

Considerable numbers were found in fish, taken between Marblehead and Nahant, but very few were in even a tolerably perfect state. I have considered it a species, upon careful examination of about fifty specimens, in which the differences pointed out between it and T. *cinèreus*, were invariable. It may possibly exist on the W. coast of Great Britain, and if it does, would probably be figured by Donovan. I have never seen his work.

PYRAMIS STRIATULUS.

Plate I. Fig. 6.

P. testâ parvà, subulatâ, albidâ, transversim tenuissimè striatâ, suturis impressis, aperturâ ovatâ, basi leviter effusâ.

Long. twelve twentieths, basal diam. four twentieths of an inch.

Hab. vicinity of Cape Ann.

My own Collection.

Cabinet of Bost. Soc. Nat. History.

Description. Shell small, subulate, imperforate, polished; color a pale bluish-white; spire moderately acute; whorls seven to nine, very slightly convex, marked with twelve or fifteen, minute, regular, revolving striæ, which are continued to the apex, diminishing in number as they approach it; sutures linear and rather deeply impressed; aperture ovate; base very slightly effuse; outer lip sharp, smooth, without any sinus or groove at its junction with the body-whorl; columella arcuated in its whole extent; internal color milk white; operculum?

Observations. I have seen but three specimens of this shell, which were all obtained from the stomachs of fishes caught within a few miles of Cape Ann. For some time I was at a loss in what known genus to place it, until Brown's work, on the Conchology of the British Islands, fell into my hands, when an examination of his genus Pyramis decided the question. He has represented on pl. 50 and 51, seventy-one species, of which, though there are one or two somewhat resembling the shell under consideration, none can be mistaken for it unless it be perhaps his P. *lævis*, pl. 50, figs. 51, 52. But had he been describing our species, he would hardly have selected a designation so inapplicable as *lævis* for a shell covered with minute striations. I am not aware that any shell resembling this, has ever been discovered before, upon our own coasts.

TURRITELLA EROSA.

Plate III. fig. 1.

T. testâ turritâ, fusco-rufescente, apice acuto, anfractibus sub-convexis, transversè sulcatis; aperturâ orbiculatâ, labro tenui, sub-crenulato; columellâ leviter callosâ, epidermide viridi-corneâ.

Long. sixteen twentieths, basal diam. six twentieths of an inch.

Hab. waters of Mass. Bay—coast of Maine.

My own collection.

Cabinet of Boston Soc. Nat. History.

DESCRIPTION. Shell turreted, with from nine to eleven slightly convex whorls, tapering gradually to a point; sutures deeply impressed; whorls having from three to five transverse sulci, with alternate, slightly elevated, rounded striæ or costæ, most numerous and strongly marked upon the lower whorl; striæ of growth apparent, slightly wrinkling the shell longitudinally; the portion above the last three whorls usually much eroded; aperture rounded, lip thin and impressed by the termination of the costæ; columella with a very slight callus, having an angular base; color of the shell a reddish brown, sometimes dark lilac; epidermis thin, of a greenish horn color.

OBSERVATIONS. Nearly a dozen specimens of this shell have been found, at various times, in the maws of fishes caught in different parts of our Bay, all of them inhabited by the ubiquïous hermit crab, who seems to be a sort of tenant-at-will of all the shells found upon our coast. I am not acquainted with any species which might be mistaken for this. There is certainly none upon our own coast, and neither Brown nor Montague, in their

Conchology of the British Islands, have described any thing like it.

PLEUROTOMA BICARINATA.

Plate I. fig. 11.

P. testâ perparvâ, fusiformi, turritâ, fusco-nigricante, transverse striatâ et sulcatâ; suturis impressis; anfractibus convexis, medio bicarinatis; aperturâ ellipticâ; labro crenulato, caudâ brevi, sinu minimo.

Long. eleven fortieths, diam. of last whorl two fortieths of an inch.

Habit. waters of Mass. Bay.

Cabinet of Bost. Soc. Nat. History.

DESCRIPTION. Shell fusiform, turreted, color an uniform dark brown; whorls six, convex, having numerous, slightly elevated, revolving ribs, with intervening striæ upon the lowest, and impressed in their middle portion by a deep sulcus, which forms a distinct revolving carination upon each side of it; sutures clearly defined; body-whorl half the entire length of the shell; striæ of growth very minute; outer lip thin, sub-arcuated, serrated on its margin by the terminating striæ; the sinus at its juncture angular, very slight, and hardly amounting to a fissure; columella arcuated at its superior third; aperture elliptical, terminated by a short canal slightly inclining to the left.

OBSERVATIONS. This little species must be extremely rare, as I have never been fortunate enough to obtain more than a single specimen, which was taken from the maw of a haddock, caught about three miles east of Nahant, in July last, and is happily perfect.

The sinus is but slightly indented, but the incremental striæ plainly indicate that it has been constant, and it is sufficiently apparent to separate the shell distinctly from Fusus. This is the first individual of the genus, which has been discovered upon our own coasts, and but two species are found on the shores of G. Britain, both small, but very distinct from ours. The genus appears to be nearly extinct in northern seas, at the present day, though formerly existing in great numbers, nearly an hundred fossil species being enumerated by Des Hayes and Defrance, the majority of them found in the great basin of Paris.

CANCELLARIA BUCCINOIDES.

Plate III. fig. 3.

C. testâ ovato-conicâ, lacteâ, apice acuto; anfractibus convexis, transverse sulcatis, longitudinaliter striatis; labro intùs candido, denticulato; columellâ leviter callosâ, arcuatâ, tri-plicatâ; epidermide olivaceâ.

Long. eleven twentieths, diam. of the last whorl seven twentieths of an inch.

Habitat waters of Mass. Bay.

My own collection, Bost. Soc. Nat. Hist., N. Y. Lyceum of Nat. Hist., John C. Jay, M. D. (N. Y.), and A. A. Gould, M. D., Boston.

DESCRIPTION. Shell oval, conical, sub-turreted, apex acute, whorls convex, varying in number from five to seven, with close transverse sulci, and longitudinally striated and sometimes plicated or rugose; sutures profound; striæ of growth distinct, body-whorl ventricose and longer than all the rest together; external color milky, interior pure brilliant white; aperture oval, base effuse and sub-canaliculate, lip thin and finely crenulated on the inner edge, but without internal striæ; columella arcuated, furnished with three oblique plaits, the middle one being the largest; a distinct callus, in old specimens, covers a small portion of the body-whorl, whose columellar extremity is bounded by a slight ridge. Shell covered with a thin, light olivaceous epidermis.

OBSERVATIONS. This shell, which was found in considerable numbers, in various parts of our outer Bay, varies materially in its outward appearance, owing to the different disposition of the longitudinal striæ. In some instances these are so fine as to cover the shell with an uniform reticulation, while in others, strongly marked folds give it a rugose or even cancellated appearance, especially the superior portion of the body-whorl.

Some of these latter varieties resemble externally the young of *Nassa obsolèta*, SAY, except in coloration. Immature specimens have the aspect of Fasciolariæ. I have never found it with the animal in, but always tenanted by a species of Pagurus. It is more analogous to C. *austràlis*, SOWER., than to any other of the genus with which I am acquainted.

FUSUS HARPULARIUS.

Plate I. fig. 10.

F. testâ fusiformi, turritâ, fulvo-lutescente; anfractibus supernè planulatis, costis obliquis numerosis instructis, transversè tenuissimè striatis; aperturâ obovatâ, labro lævi, caudâ per-brevi.

Long. eleven twentieths, diam. of last whorl five twentieths, of an inch.

Habitat waters of Mass. Bay.

Cabinet of Boston Soc. Nat. History.

DESCRIPTION. Shell oblong, fusiform, turreted, color yellowish-brown, whorls six to eight, convex, slightly angular superiorly, and planulated at the suture, which is clearly defined; they are traversed by numerous, oblique, rounded ribs, to the number of nineteen on the body-whorl, whose interstices are filled, with delicate but distinct, transverse striations, extending nearly across the ribs; aperture elongated, oval, rendered somewhat angular at the outer, superior extremity, by the planulation of the body-whorl; lip sharp and smooth internally; columella smooth, arcuated, with a slight callus upon its inferior portion; canal short and inclined to the left.

OBSERVATIONS. This shell, of which I have never found but one perfect specimen, has, at first sight, considerable resemblance to *Fusus turriculus*, MONT., especially in the form of the aperture and disposition of the ribs, but is deficient in the mucronations at their summits, so prominent in that species, whose ribs, moreover, are flattened or angular, instead of being rounded as in ours; the color also is very different.

It is easily recognised, by the great number and regularity of its ribs and striæ, and the flattened appearance of the upper portion of the whorls, which give the body or lower whorl something the shape of a harp, on which account I have given it its name.

My specimen was taken from a cod, taken off Phillips's Point, in Lynn, last September.

FUSUS PLEUROTOMARIUS.

Plate I. fig. 9.

F. testâ acutissimè elongatâ, fuscâ; anfractibus convexis, plicis longitudinalibus instructis; aperturâ ovatâ, labro intùs lævi; columellâ arcuatâ, caudâ brevi.

Long. sixteen twentieths, diam. of last whorl eleven fortieths of an inch.

Habit. deep water in Mass. Bay.

My own collection.

Cabinets of Bost. Soc. Nat. Hist., A. A. Gould, M. D., Boston, and John C. Jay, M. D., New York.

Description. Shell fusiform, elongated, tapering to an acute point, of an uniform dark fawn-color, sutures distinct, whorls seven to nine, covered with rounded undulating ribs or plaits, to the number of eighteen upon the lowest, alternating with each other at the sutures, and most prominent on the superior whorls; in some instances these folds become obsolete about midway on the body-whorl, which is nearly half the length of the shell, with delicate, transverse striæ near its middle; in some individuals these striæ are apparent on all the whorls; outer lip tranchant, smooth internally, the edge forming a regular outward curve; a slight compression is perceptible about its middle portion; columella arcuated superiorly, its inferior third inclining, rather abruptly, to the left; aperture an elongated oval, terminating in a brief sub-ascending canal.

Observations. This elegantly formed little shell was taken from the stomach of a cod, caught near Lynn. It appears to be rather uncommon, as only two perfect, and as many broken specimens, were found, in examining more than three hundred fishes.

It closely resembles F. *pyramidàtus*, Brown's MSS., found at St. Abbs Head, England, differing from it principally in the form of its aperture and number of its ribs.

TRICHOTROPIS COSTELLATUS.

Plate III. fig. 2.

T. testâ ovatâ, turrito-acutâ, fuscescente, epidermide foliaceâ luteo-albidâ tectâ; spirâ canaliculatâ; anfractibus costis 5 rotundatis instructis; aperturâ ovali, lutescente; labro costis indentato; columellâ arcuatâ, albescente.

Long. fifteen twentieths, diam. of last whorl nine twentieths, of an inch.

Hab. deep waters of Mass. Bay.

My own collection.

Cabinet of Bost. Soc. of Nat. Hist., and those of John C. Jay, M. D., N. Y., and A. A. Gould, M. D., Boston.

DESCRIPTION. Shell ovate, acutely turreted; spire elongated; whorls six, the lowest ventricose and larger (longer) than all the rest together, having four or five and sometimes even six, revolving, prominent, rounded costæ, with intervening striæ; the largest of these costæ borders the superior portion of the whorls, forming distinct angulations; numerous fine longitudinal striæ, not interrupted by the ribs, cover the whole shell; color a dull yellowish or brownish white; aperture oblong-oval; narrowed and slightly channeled at the base; lip continuous at its superior extremity, and distinctly indented by the costæ; columella whitish, arcuated, with a slight projection near its lower third, and abruptly compressed near its base, which inclines to the right, and forms a sharp angle with the outer lip; umbilicus slight, and bordered externally by a strongly marked imbricated ridge. Interior a light brown. Epidermis a dirty whitish yellow, thick, and foliated or laminated by its successive growth, which traversing the costæ, gives the shell quite a clathrate appearance. At each stage of increment, the epidermis is produced upon the costæ into two or three, stiff, corneous filaments or bristles, which, when the shell is wet, cause it to appear covered with short hairs; the same setæ are apparent, though less conspicuous, upon the ridge bounding the umbilicus.

OBSERVATIONS. The genus Trichotropis was proposed by Sowerby, and is undoubtedly valid. Two species only have been discovered, previous to the present, T. *Sowerbiénsis*, LESSON, from Melville's I., Arctic Seas, and T. *boreàlis*, SOWERBY, from Coast of Newfoundland. A figure of the latter is given in *pl.* ix, *figs.* 6, 7, *vol.* iv. of *Zool. Jour.* which differs principally from ours in being much broader, having but two ribs instead of four or five, and the setaceous processes being much more conspicuous. The epidermis is also described as corneous, while that of our species may with more propriety be termed coriaceous. The difference is so constant, that I cannot but consider them as distinct species.

Considerable numbers of this shell were taken from the entrails of fishes, caught between Cape Ann and Cape Cod. It varies very considerably in different stages of growth. In young specimens the lip terminates abruptly, at its juncture with the columella, while in adult individuals it is continuous and reflected upon the columella, in such a manner as almost wholly to conceal the umbilicus. The general characters of this shell would seem to indicate its vicinity to the Purpuræ.

In addition to the species described in the preceding pages, the following have been observed in our waters, which are not upon the list prepared for Prof. Hitchcock, by the Society, in 1835.

Modiola *discors*, Lin. Stomachs of fish in our Bay.
" *discrepans*, Lam. " " "
Valvàta *tri-carinàta*, Say. Wenham Pond.
Nàtica *immaculàta*, Totten, from fishes in all parts of the Bay.
Galerículum *lævigàtum*, Brown.
" *ovàtum*, do.

Fusus *turriculus*, Mont.

Nassa *acùta*, Say.

These last four are common in the stomachs of fishes taken abreast of Cape Ann.

Actæon *trífidus*, (Jaminia?) Totten. Steamboat landing, Chelsea.

Polyclinum —— ? Upon an old shell in our outer Bay.

Botryllus *stellàtus*, Pallas. Seen covering the bottom of a vessel that had lain several months at one of the wharves in Boston.

Ascídia *rústica*, Lin, abundant in vicinity of Nahant.

" *microcósmus*, Cuv., wharves and bridges near Boston.

" *intestinàlis*, Lin. Found on old sunken logs, &c. in our harbor.

" *pedunculàta*, Lam. Nantasket Beach near Hull.

For the very accurate drawings of the shells represented in the accompanying plates, I am indebted to the kindness and skill of Dr. A. A. Gould; to whom I am also under obligation, for the free use of the valuable notes, made by him upon such of the species as have fallen under his observation, while engaged in researches into this department of Natural History, for the survey of the State of Massachusetts, now in progress.

It affords me much pleasure to learn, that others have been induced, by the success attending my examinations of the stomachs of fishes, to pursue a similar course; and that several more new species have been thereby already discovered. I would express the hope, that ere long our Bay may be explored by the dredge. The richness of the accessions which such researches would not fail to bring to light is here sufficiently indicated.

ART. IV.—NOTICE OF THREE SPECIES OF TRILLIUM, FOUND IN THE VICINITY OF BOSTON. BY J. E. TESCHEMACHER. Read Dec. 4, 1837.

THERE are many of the native plants of America, which can only have been studied by the plurality of European Botanists, through the medium of dried specimens; and the observations on which, in the Botanical works published in this country, are sufficiently meagre, not indeed, from any want of ability in the authors, but simply because the plans of their publications did not admit of more copious or minute descriptions. Several of these are, no doubt, destined to remain unexamined properly, for a length of time. The successful raising from seed, transplantation, and cultivation of them, even in their native country, is by no means an easy task; they are, therefore, not likely to become common enough in the living state, in Europe, to invite that rigid and thorough examination of their habits and structures, which, in the present state of Botanical science, is so necessary for a perfect description of them. This knowledge and information must consequently be sought for and obtained here, and will, no doubt, be highly welcome, as well as expected, by their European brethren, from those Botanists, who, by vicinity to the habitats of rare and curious plants, may be enabled to study and explain their natural habits or variations.

It appears, that a true knowledge of the seminal varieties, of the variations produced by cultivation, and of the earliest tendencies to exhibit change in the different parts of the vegetable structure, derived altogether from observations on living plants, is essential to a right determination of that constancy in them, on which alone, true and distinct characters can be promulgated. Nor can the lines be too strongly marked, or too minutely drawn between the undeviating forms and characters of plants, and those variations which Nature permits, nay courts, in different soils, situations and circumstances.

In elucidation of these observations, it is only necessary to refer to the numbers for May, 1837, of the two principal Botanical periodicals published in London, one edited by Professor Hooker of Glasgow, the other by Professor Lindley of London, where the descriptions and figures of ***Platystigma lineàris*** (lineàre) contrast as follows.

By Sir W. J. Hooker.	By Prof. Lindley.
Leaves *radical*, linear, acute, glaucous, glabrous.	Folia linearia, *opposita*, aut *ternatim verticillata*.
Scapes several from the same root.	Pedunculi solitarii, *axillares* et terminales, caulibus duplo longiores.

Nor is it an uncommon confession, in Botanical works, that what had once been considered a good species, had afterwards proved to be a starved or luxuriant state of a plant already described.

That the characters of vegetable transformation have yet much knowledge to yield to the patient inquirer, may be gathered from the number of the Botanical Register, for April, 1837, above alluded to, where there is a figure of one stem, bearing flowers of his genus Monachànthus at the top, and of his genus Myànthus below. The discovery of such facts, which cannot be too quickly or too widely disseminated among Botanists, throws no discredit on the laborious investigations of the Orchidaceous family, to which the Professor has, with so much success, devoted his talents; it only shows the necessity of a more intimate knowledge of the habits of living plants.

Trillium is placed, by the natural arrangements, in the family of *SMILACEÆ*, which, owing to the dicotyledonous venation of the leaves, particularly in Trillium, forms a connecting link between the two great divisions of Exogenæ and Endogenæ.

The generic character is, *Perianth* deeply six-parted, spreading, sometimes reflexed, three outer segments sepaloid, three inner petaloid; *ovary* superior, stigmas sessile, spreading, either distinct or approximate; *berry* three celled, cells many seeded; *leaves* in threes, verticillate at the summit of the stem; *flowers* solitary, terminal.

It emerges from the ground with the three leaves folded round each other, their summits bent vertically towards the surface, so that the geniculation first forces its way through the earth; these leaves gradually rise, unfold, and spread horizontally, discovering the flower-bud erect, which had been previously enveloped by them.

The use of the terms sepal and petal, for the outer and inner segments of the perianth, will render the following remarks more intelligible, although perhaps it might be sanctioned in this instance by more cogent reasons.

Of the genus Trillium, Elliot enumerates eleven species, some of which, I apprehend, are mere varieties; and observes, that under great simplicity and conformity of habit, it contains and conceals many species. He also states of T. *cérnuum*, that it is the largest species known of the genus; this, at least, does not coincide with the T. *cérnuum* of these regions, which is undoubtedly the true T. *cérnuum* of botanists, and is the smallest of the genus.

The most perfect and minute description of Trillium, is that given by the author of "*Flora Cestrica,*" a work of great interest to every lover of Botany. In his account of T. *péndulum*, Muhl., the T. *cérnuum* of other authors, he observes, "that there has been much perplexity, among American botanists, concerning this species, in consequence of Pursh having confounded it with the true T. *cérnuum* of the south, (the T. *Càtesbei* of Elliot, T. *stylòsum* of Nuttall)."

Dr. Bigelow, in his "*Flórula Bostoniensis,*" describes three species growing in this vicinity, T. *cérnuum*, T. *erectum*, T. *pictum*; to these three alone, my observations have been confined; T. *grandiflorum* of Salisbury, is added, on very good authority, to Professor Hitchcock's catalogue of the plants of Massachusetts, but it must be of rare occurrence.

Dr. Torrey, however, remarks that amongst his specimens of Trillium, are three from Deerfield, Mass.; which have three *distinct, though short styles,* with the stigmas nearly erect; in other respects, they resemble T. *erythrocàrpum*, the *pictum* of Bigelow.

Nuttall makes the same observation, regarding the style and stigma, in describing a T. *cérnuum*, Michaux, from Carolina and Georgia, of which he observes, "the peduncle is rigidly recurved under the leaves, petals rose color, undulated, germ with *a distinct, solitary style,* as in no other species of the genus, and three smoothish stigmas, somewhat shorter than the style.

The earliest figure of Trillium is in Cornutus, a writer in the beginning of the 17th century, on Canadian and other plants; it is a mere wood cut, in the style of those times, given under the name of ***Solànum triphyllum Canadénse***, and is probably T. *eréctum*. He mentions that it is dark purple, although sometimes found white.

There is a figure of T. *eréctum*, in Curtis' Bot. Mag. for Feb. 1800; but although well drawn, and colored with truth, it is totally deficient in distinctness of the various parts.

T. *píctum* has been figured in Sweet's "British Flower Garden," but I have not seen it.

1. TRILLIUM *cérnuum*, Bigelow.
péndulum, Muhlenberg.

Observations made on plants gathered in various places in the vicinity of Boston, and on others transplanted into the garden with a view of noticing their habits.

The three leaves are of a beautiful spring-green, broadly rhomboidal, almost orbicular, acuminate, some specimens more abruptly so than others, on very short petioles, the centre forming a kind of bed for the peduncle of the flower; they have three principal nerves, and two subordinate ones running near the margin, from all of which, smaller veins reticulate, precisely as in dicotyledonous plants.

The bud is ovoid, gradually tapering to an acute point; it remains erect until a few hours previous to opening, when it droops between two of the leaves and is stiffly recurved against the stem, so that it cannot be raised without breaking. Æstivation valvular, sepals three, green, ovate-lanceolate, reflexed very soon after opening. Petals three, of a pure, delicate, opaque white, nearly the same form as the sepals but rather larger, also reflexed. Stamens six, arising from the base of each petal and sepal; anthers attached their whole length, with the face towards the ovarium. Pollen valves two, opening laterally from top to bottom; pollen of a light lilac color, globular, each grain with a netted external membrane, said by Dr. Hugo Mohl to secrete an oily substance which determines its color. I have observed many with a small projection, like a pedicel, probably the situation of the tube passing down the pistil. Stigmas three, sessile, curved back and opening like the valve of an anther, each being formed by the union of the upper parts of the two adjacent projecting angles of the ovarium, which is six-angled and three-celled; placentæ central, dissepiments in the interior of each alternate depression between the angles, such depression being that opposite to the verticillus of sepals; the placentæ meet in the centre but are not attached to each other. When the fruit is ripe, it is a red, soft, pulpy berry, in which it is difficult to distinguish the various parts or their attachments.

The seeds are monocotyledonous and fixed by a species of funiculus, sufficiently visible in the early stages of its growth, to the two sides of each placenta; at maturity the chalaza is very distinct, the vessels of the raphe proceed from thence, on the outside of the seed, about midway towards the foramen, where they branch out as in fig. 9, and are, as well as about one fourth of the seed, enveloped in a pulpy mass, adhering with some tenacity to the testa, probably a secretion or emanation from these vessels, as it is found also on abortive ovula, where there is nothing but the testa, although not so largely developed as in the perfect seed. The raphe can only be seen when the seed is moist; a few minutes exposure is sufficient to dry it up and render it invisible.

The outer and inner testa are membranous, the first of a darker brown than the other, reticulated with veins, the larger vertical of which are elevated when the seed is dry, so as to give it a rugose or shrivelled appearance; when moist in the berry, or previous to germination, these outer coverings are so distended as to be quite smooth.

The embryo is extremely minute, nearly globular, situated at the end opposite to the chalaza, enveloped in a somewhat fleshy and cartilaginous albumen, the radicle turned towards the foramen. With exceeding strong microscopic powers, I could not discover any signs of internal organization in this embryo; it rather resembled the sporule of ferns. The sepals, petals and stamina are persistent, even after the ripe berry has fallen from the stem, showing the absence of all articulation.

This species is gifted with a delightful fragrance, somewhat resembling that of the Tuberose, but more delicate. It flowers in June, and seems to prefer damp, shady places.

Figure 1. represents a deviation from the usual structure of this species; the original plant is in my possession, alive: the specimen dried so that all the parts are exhibited, I have placed in the Society's Herbarium. It has a fourth stigma which is not quite so large as the other three, eight stamens and anthers, with one half of the third petal antheriferous; there is likewise an additional segment of the perianth, one half of which is green and sepaloid, the other half white and petaloid, the division distinctly marked; its situation is between the verticillus of sepals and petals, as that of the antheriferous petal is between the verticillus of petals and stamens. I could not discover any difference between the pollen of the antheriferous petal and the other. It will be seen that this variation arises from an increase of parts, irregularly descending from the pistil, as well as from the conversion of one part into another.

2. Trillium *pictum*, of Pursh and Bigelow.
erythrocárpum, Michaux.
undulàtum, Willdenow.

Observations on cultivated plants, and plants from the vicinity of Lancaster. Figs. 2, 3, 4, 5, 6.

It would be useless to recapitulate characters which agree with the former. The peduncle appears by the cuticle to be twisted; it has reddish streaks. The three leaves are on short petioles, of a red brown, particularly on their first emerging from the earth; they are by no means abruptly acuminated, but elongated towards the summits. The flower remains erect, is of a clear, transparent white, with dark, lake-colored streaks rising from the base of each petal, spreading upwards and adding much to its beauty; the petals are longer than the sepals, undulated toward their termination, but this length, as well as the undulation, varies much in different specimens. In this species, the stamens are united full one eighth of an inch to each petal and sepal, as seen in figs. 2 and 3; the adhesion is perfect, the veins of the filament passing under the cuticle precisely as in perigynous insertions. The pollen is perfectly white, the flower without odor of any kind. The stigmas, although sessile, are narrower and more inclined to undulate. Ovarium ovoid, not angular; berry, when ripe, red and pulpy. When a thin section of the ovarium, in its early state, is dried between two pieces of talc, the tube or vessel in the placenta, through which the granules of pollen or their tubes, are conveyed to the ovule, being deprived of its moisture, is empty and beautifully visible, (fig. 6, a). It flowers rather later than T. *cérnuum*, is found in woods, and likes moisture.

There is a dried specimen in the Society's Herbarium, of a Trillium from Niagara, which has many of the characters of *pictum;* yet the pistils are much longer, the petals very long, attenuated and undulate; the sepals nearly as long, the peduncle very long and elegantly slender, like T. *grandiflòrum* ; the leaves more abruptly acuminated, with five very prominent nerves; the fruit is not only angular, but distinctly winged at the angles.

3. TRILLIUM *erectum,* of Authors.

Observations on plants originally from Lancaster and cultivated.

The three leaves are green, sessile, broadly rhomboidal, acuminate; peduncle inclined, flower rather nutant, petals of a dingy, dark purple color, larger than the sepals; the centre nerve of the petals is often green on the outside, showing an approach to the sepal. Stamens arising from the base of sepal and petal, free, not united. Pollen yellow, in form the same as the others. Ovarium six angled like *cérnuum;* in its early stages the internal succulent skin of each cell (endocarp) is separated from the side, forming a distinct sac in which the ovula are contained (fig. 8 *a a a*); there is no intervening skin, and when the berry is ripe, the vacant space is filled with pulp, so that this construction is no longer observed. I have seen this in the present species only. The seed is precisely the same as in the others. The odor from this is disagreeable. It flowers in June, and is found in old woods.

I have a living plant from Thomaston, Maine, resembling T. *eréctum* in every thing except the ovarium, which is ovoid, without angles, like T. *pictum,* and the size of all the parts, which considerably exceeds that of the plants from this vicinity, the height being about one foot, and the flower from four to six inches across.

I have sown seeds, for the last two years, in the spring, but have been unable to make them vegetate. This autumn I sowed them as soon as ripe; but although from moisture they swell, there is yet no appearance of germination; on the contrary, there is every indication of their destruction by becoming mouldy. The nearest approach to vegetation is in some I have kept just moist in their own pulp; these seem ready to burst. From the plants being usually found in moist places, it is probable that this is the state in which they naturally remain until spring. It is, however, not difficult to propagate by division of the præmorse, tuberous root, and is easily preserved.

The specimen I received from Thomaston, which was in the most luxuriant state of growth, had a large piece of decayed wood completely enveloped by the fibres of its roots. The plant of T. *cérnuum*, with a multiplication of parts, I cultivated in peat earth and decayed sawdust; but as it was transplanted from its native spot when out of flower, it is impossible to say whether the present was its original state from the seed, or produced by luxuriance of the soil in which I placed it.

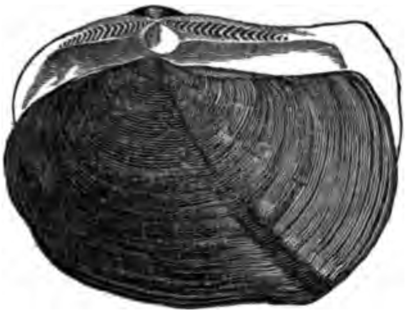
DESCRIPTION OF THE FIGURES.

Fig. 1. T. cernuum with multiplication of parts.
  a. Antheriferous petal.
2. Petal of do.
  a. Adhesion of the stamen.
3. Sepal of do.
  a. Adhesion of the stamen.

4, 5, 6. Ovarium of do. and sections when the flower was a week old.
  a. Tube or vessel for the passage of the granules of pollen.
7. Ovarium of T. erectum ten days after the opening of the flower.
8. Section of do. do.
  a. a. a. The sacs formed by the inner skin (endocarp) inclosing the ovula.
9. Seed ripe (magnified).
10. Section of do. (magnified).
  a. Chalaza. b. Raphe, and the vessels branching off. c. Foramen. d. Embryo. e. Pulpy mass.

ART. V.—DESCRIPTION OF A NEW SPECIES OF NUCULA FROM MASSACHUSETTS BAY. By D. Humphreys Storer. Read January 31st, 1838.

Nucula thraciæformis.



N. testâ ovato-oblongâ, transversâ, nigrâ, crassâ; anticè rotundatâ, posticè subtruncatâ et compressâ, umbonibus prominentibus; cardine foveâ magnâ.

Shell ovate, transverse, equivalve, inflated, gaping at both extremities, with numerous, very distinct, concentric lines of increment, covered with a yellowish-green, polished epidermis in young specimens, concealed under a black pigment, which readily rubs off in the recent specimen, giving a sooty appearance to the fingers. In the adult shell the epidermis is rather a dirty brown. *Beaks* slightly prominent over hinge margin. An obtùse angle, more elevated and wider at its lower half, runs obliquely from the umbones to the posterior base of the shell, serving as a boundary to the anterior inflated portion. *Posterior portion* of shell much compressed, its epidermis is of a lighter color, and the striæ of increase are much more apparent, than upon the anterior portion. *Anterior* margin, rounded; *posterior*, somewhat truncated. *Within*, perlaceous. *Teeth*, numerous and peculiar; those contiguous to hinge, small, those farther removed from fosset, very strong, sharp, angulated, higher than wide; the teeth of one valve shutting very closely into the excavated teeth of the opposite valve, form a very powerful hinge. *Fosset* capacious.

This shell, of which I have seen but one perfect specimen, and which, in its general outline, resembles somewhat a Thracia, I took from the stomach of a Platéssa—the *dentàta* of Mitchill—called by our fishermen, *Sand dab*:—this fish was caught off Provincetown, Cape Cod, in about thirty fathoms of water, and was brought to our market the last of December, 1837. I am thus minute, because it is usually thought sufficient to state that a shell is taken from a "*fish's stomach*" without the slightest attention being paid to the *species of fish*, or *the season of the year*, in which the fish is taken, and consequently but little light is shed upon its probable locality. Thus even Say, in his description of the ***Nucula limátula***, says, his imperfect specimen was presented to him by Mr. Nuttall, "as having been taken from the stomach of a fish at Nahant." Now, as some of our fishes live in very shallow water, and others are found only at great depths, it is of no slight importance to the conchologist to know where he may dredge with a prospect of success. And again, as the same species of fish, at different seasons, is found upon different bottoms, or at different depths, we should know something of their habitats to follow up our investigations understandingly. And then, the dredge will be dragged in spring, where a particular fish containing a *Nucula*, was found in autumn; and the winter residence of a Platessa will not be searched in vain in midsummer.

Since the above description was drawn up, I doubt whether a ***flat-fish*** has been brought into market, whose entrails have not been searched and researched for ***Nuculæ***. I have been not a little amused at the eagerness with which the knife has been applied to their distended stomachs; with so much precipitancy has this been done in several instances, as to ruin the enclosed shell. I have had the good fortune to procure, from one fish, three fine specimens of this shell. Of these, the one now before me, measures two inches two lines in length; one inch three lines in width across, from umbones; and six lines in depth. All, which have yet been found, were contained in the stomach of the ***Platéssa dentàta***—a species quite common in our markets at this season of the year. I have known of but two specimens of the ***Pleuronectes*** (Platéssa) ***planus*** of Mitchill, having been brought to Boston market this winter; and although these were taken at about the same depth as the *dentàta*, their stomachs contained only the *Nucula limàtula, Fusus córneus, Nàtica triseriàta* and *Nassa trivittàta.* The specimens of the *planus* were taken at Cape Ann ; but the distance of forty miles, between Cape Ann and Provincetown, would not account for this shell not being found in both fishes. The two species, it is seen by the above remarks, are similar in their voracity ; but one of the principal characters of the *dentàta* is its uncommonly large mouth, while the mouth of the *planus* is very small. So that if the N. *thraciæformis* should be found in the stomach of the *planus,* they will probably be immature shells. During the ensuing season, I contemplate laying before the Society a paper upon the habitats of some of the mollusca of our waters ; as, during my ichthyological investigations, undertaken in behalf of the State of Massachusetts, I have been enabled, by examining carefully our fishes, to ascertain the depths at which several of them are usually found—and in what species of fish we may expect to find certain species of mollusca.

NOTE. Misled by Mitchill's description of the specific characters of the *Pleuronectes planus*, I supposed the Platessa taken at Cape Ann, to be that fish. Having satisfied myself since, that it is a new species, I would propose for it the name of P. *ferruginea.*

Specific characters. Body smooth ; right side of a reddish slate color, with a great number of irregularly formed ferruginous spots. Mouth small ; lips tumid. Lateral line making a high arch over pectorals.

This species more nearly resembles the *Platessa limanda* (L.) than any other fish. From that, however, it differs in being smooth ; in having its teeth closely set together ; and in the length of the pectoral fins compared to the length of the head, they being in the *ferruginea* much shorter than in the *limanda.* A minute description of this species will appear in the Ichthyological Report prepared for the State.

ART. VI.—OBSERVATIONS ON THE PLUMAGE OF THE RED AND MOTTLED OWLS (STRIX ASIO). BY SAMUEL CABOT, JR. Read February 14, 1838.

I MUST confess, that I am almost inclined to doubt myself, when I make an assertion that contradicts a statement of two of the most accurate ornithological observers of the present day, viz. Audubon and Bonaparte; and had I not, what appears to me sufficient proof on my side, I should not venture to do so. When I read, several years since, in Mr. Audubon's Ornithological Biography, Vol. I. page 456, that, "As the Red Owl of Wilson and other naturalists, is merely the young of the bird called, by the same authors, the Mottled Owl, and which is, in fact, the adult of the species under consideration," I felt inclined to doubt the accuracy of the statement; and in order to satisfy myself with regard to it, I caught, in the month of March, an individual of this species in the red plumage, from a hollow apple tree in the vicinity of Cambridge, where I was then residing as a student. I kept this bird in my room about a month, during which time very little change occurred; that little, however, appeared to be a deepening of the red. At this time, the bird was unfortunately killed. About a year after, I obtained another, in a hollow oak tree, in the vicinity of Fresh Pond, which I kept about two and a half months in my room at Cambridge, and then brought it to this city, where I kept it about a month and a half more, when it was killed by a mischievous boy. This happened in June. The only perceptible change in this was the same as occurred in the other, viz. a deepening of the red, and a more distinct marking off of the white. But still I was by no means satisfied;

for Mr. Audubon says, they do not acquire their full plumage till August. I exerted my utmost to throw more light on the subject, but was unsuccessful until the last summer, in June. I was then at the White Sulphur Springs, in Virginia. One day, as I was out with my gun in search of birds, and was walking with great care through some thick evergreen trees, whose branches hung very close to the ground, I came suddenly upon a Red Owl, sitting upon a low bough, at about the height of my head from the ground. I came within ten feet of it without being perceived, and saw two young mottled owls, about half the size of the red owl, sitting at its side, and two more about six or eight feet off. I retired with the utmost care, and towards dusk softly returned to the spot, crept up as near to them as I dared, and sat down, concealed by the overhanging boughs of the tree, beneath which I had placed myself, and remained perfectly quiet. In about half an hour, the red owl began to show signs of activity ; and, shortly after, darted off on noiseless wings into the surrounding woods. In a short time she returned, and fed the two small mottled owls, which had been roosting at her side when I first saw them. After remaining a few moments with them, she again flew off, and returning as before, went to those two that had been the farthest off. As soon as she alighted, I pulled trigger, and laid them all dead on the ground. One of the young I skinned, and have now in my possession. The red owl appeared to be in precisely the same plumage as the two which I had formerly kept.

In order to render it easier to judge of the value of the facts which I have adduced, I will endeavor to sum them up, and render them as concise as possible.

First, Mr. Audubon states, that this bird assumes its adult plumage (i. e. the mottled), about the middle of August. I have found a number, including the two I have already mentioned, in winter and in early spring, in holes by themselves, and all in the red plumage. Now, no one, I think, will pretend, that they could have been hatched and left to themselves so early even as the first of March; and yet I have killed them even earlier than that, in their supposed immature plumage.

And again, if there was to have been any change in the plumage, it seems hardly possible, that it should not have begun to manifest itself before the first of June. Then, too, the fact of my having killed a red owl in the act of feeding mottled owls of half her own size, would appear almost conclusive evidence that the former was the adult, the latter the immature bird. For no one will, I think, regard it as at all probable, that she had herself been hatched that season; and the birds she was feeding were, morever, evidently her young.

It may not be amiss to add, that Mr. Audubon himself has represented, in his plate of this bird, the one he calls the old bird as smaller than its young. I have myself uniformly found the birds with the mottled plumage, to be smaller than those of a red.

It appears to me, therefore, that the Mottled Owl is the young, and not the old bird of the STRIX *àsio*. But if any one, whose eye this may meet, should have an opportunity to keep a Red Owl through the summer, and to observe whether any change in the plumage does take place or not, he will confer a great favor on me, as well as upon every one who is interested in this subject, by placing the matter beyond a doubt.

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ART. VII.—MONOGRAPH ON THE FAMILY OSTEODESMACEA OF DESHAYES, WITH REMARKS ON TWO SPECIES OF PATELLOIDEA, AND DESCRIPTIONS OF NEW SPECIES OF MARINE SHELLS, A SPECIES OF ANCULOTUS, AND ONE OF EOLIS. By JOSEPH P. COUTHOUY. Read June 30, and Aug. 1, 1838.

Genus THRACIA, Leach.

GENERIC CHARACTERS. Shell thin, transversely oval, inequivalve, corbuliform, right valve the more convex, inequilateral, slightly gaping at both extremities ; beaks well marked, and inclined a little backwards ; hinge having upon each valve a more or less prominent, horizontal, spoon-shaped apophysis, receiving the internal portion of a ligament, visible also externally ; this internal ligament is (*sometimes*) posteriorly attached to, and strongly supports a cylindrical ossiculum, in the form of a semicircle. Anterior muscular impression narrow and elongated, united to the posterior, which is small and rounded, by a palleal impression strongly excavated posteriorly.

OBSERVATIONS. The genus THRACIA, instituted several years since, by Dr. W. E. Leach, has been unhesitatingly adopted by all subsequent Zöologists. It is, by its characters, closely allied to the Myæ, Anatinæ, and Corbulæ, the type having been included, by previous British authors, among the first of these genera, and by Lamarck among the second, under the appellation of A. *myàlis*. M. Deshayes having observed upon one of Lamarck's Anatinæ, a singular detached ossiculum, supported in its place between the cardinal callosities, by a portion of the internal ligament, was led thereby to examine more closely than had previously been done, the structure of analogous shells. The result of his researches was, the establishment of a family denominated Osteodesmacea,' embracing 1st, ANATINA, Lam., restricted to those species having a tricuspidate ossiculum, attached to the anterior side of the ligamentary supports: 2d, PERIPLOMA, Schumacher, in which the ossiculum is subtriangular, and placed between the supports and the dorsal edge: 3d, THRACIA, Leach, with this appendage, where it exists, cylindrical and semicircular, situated at the posterior extremity of the internal ligament: and 4th, OSTEODESMA, Deshayes, having it in the form of a small, quadrangular plate, resting upon the internal face of the supports themselves.

Although the three last named genera have been so recently established, great disorder and confusion already exists, both in respect to their generic and specific characters. In the Thraciæ, this is in a measure owing to the type of the genus, MYA *declivis*, Pennant [*Anatina myàlis*, Lam.,] having been confounded by some of the

British writers with another species, **Mya** *declivis*, Donovan, [*Anatina convèxa*, Turton and Brown]. A more serious error, and one far more injurious in its results, as it confounds genera as well as species, is that committed by M. de Blainville, in consequence of imagining a shell before him to be Lamarck's **Anatina** *myàlis*, and suppressing that species as a Thracia, on the supposition that it was the type of genus Osteodesma, Deshayes, which again he erroneously considers synonymous with Periploma, Schum. See Manuel de Malacologie, page 659 et seq. "Nouvelles additions et corrections."

That the shell here characterized by M. de Blainville, was not in truth A. *myàlis*, but some other species,. there can hardly exist a doubt, as it will presently be attempted to show.

M. Rang, in his "Manuel des Mollusques," genus 284, has adopted the error of M. de Blainville, in regarding as identical, the two genera just referred to; but expresses a conviction that it was the animal of some other species than A. *myàlis*, which served for the observations of the latter, as he had himself examined the animal of that shell, and found it to differ materially from the description given in the "Manuel de Malacologie."

M. Deshayes, in his recent edition of Lamarck, while he points out one mistake made by M. de Blainville, in confounding Osteodesma with Periploma, perpetuates another, by quoting the characteristics of the species examined by that naturalist, as really pertaining to A. *myàlis*. The generic characters of Thracia, here given, are taken from Deshayes and Blainville. In that part mentioning the existence of an ossiculum attached to the ligament, I have inserted the word "*sometimes*," because it does not appear to be a constant character. Although M. Deshayes having seen it in one species, presumes it to exist in all, yet, as it is not mentioned in any of those described by him in the Encyc. Methodique, nor in any of the descriptions of those found on the British coast; nor by M. Kiener, in his Iconography, and is not met with in T. *Conrádi*, Nobis, of our own shores; — it is evident that it is not to be admitted as a generic character without this qualification.

M. Deshayes, in his preliminary observations on Thracia, Encycl. Method. Vers, vol. III., states, that he has observed the existence of an ossiculum in one species at least, and concludes from analogy that it is common to all, and this assertion is repeated in his recent edition of Lamarck, VI. p. 82; but strangely enough he has neglected, in either work, to designate in any way the species referred to. True, in the article Anatina of the Encyclopédie, he speaks of having witnessed an ossiculum in several of Lamarck's genus of that name, and among others, instances A. *myàlis*, which, in his edition of Lamarck, published three years later, he considers the type of Thracia. In his notes upon Anatina, however, in that work, VI. p. 77, he contradicts this statement by remarking, "enfin *l'Anatìna myàlis*, Lam., paraît n'avoir point d'osselet à la charnière, mais son ligament et ses cuillerons ont une forme particulière." It might be supposed that this settled the question, but on turning to his note on this same species, page 82, of the same work, we find him adopting for it the description given by M. de Blainville, of the animal erroneously considered by him as that of A. *myàlis*, and the type of Osteodesma, where he remarks, " une sorte de gaîne qui entoure une sorte de repli de manteau, contient l'osselet cardinal." It is difficult to account for such glaring discrepancies in notes on the same species, only five pages apart. The sole way in which it appears possible to reconcile or clear up these conflicting statements is, by assuming that the species examined by M. de Blainville was not A. *myàlis*, but that M. Deshayes, while he perceived that the former was in error respecting its generic character, was not aware of his having mistaken the species also; and that the contradictions relative to A. *myàlis*, in his own notes on Lamarck, occurred through inadvertence; they having, perhaps, although printed together, been written at long intervals.

In this assumption, with regard to M. de Blainville, at least, we are fully borne out by his description and figure, as well as his remarks. He states, pp. 564, 660, that he had never seen either A. *myàlis* itself, or a figure of it, and suppresses it, p. 659, under the impression that the shell before him, a true Periploma, was that species. His description, however, is wholly irreconcilable with Lamarck's, who says A. *myàlis* resembles Mya *arenària* externally, is even larger and *rather solid*, although semi-transparent. M. de Blainville, on the contrary, speaks of his shell as *exceedingly thin and fragile*. His description is closely applicable to A. *trapezoides*, Lam., of which he gives a figure in connection. After carefully viewing the case, therefore, in all its bearings, the conclusion appears irresistible, that the error of M. de Blainville arose from the shell given to him by M. de Gerville, as A. *myàlis*, being really A. *trapezoides*; and, that recognising it as the latter, and relying upon the authority of M. de Gerville for its being the former, he determined the two species to be identical.

This is farther confirmed by his observation, p. 660, where, speaking of Periploma, he says, "nous l'avons caractérisé d'après l'*Anatina myàlis*, connue sur nos côtes, et dont nous devons la connoissance, ainsi que celle de son animal à M. de Gerville. L'osselet singulier qui en fait le caractère principal, est contenu dans une sorte de gaîne transverse, qui entoure un repli de manteau. C 'est cette espèce à dent mobile, dont il est parlé à la fin des observations sur le genre ANATINE." Now, on turning to the passage referred to (p. 564), we read—"M. Deshayes nous a fait faire l'observation que l'anatine trapézöidale a une dent mobile sur la valve droite, et se logeant dans l'angle formé par le cuilleron." M. Deshayes moreover, in his continuation of Lamarck, published nearly ten years after the Man. de Malac., speaks of P. *trapezoides* as the only species yet known to him; whereas, if M. de Blainville's had not been that shell, there would of course be another. It is necessary therefore, to restore A. *myàlis* as a Thracia, it having been suppressed by M. de Blainville, p. 660 of his Manual, on false data. It may, however, reasonably be doubted whether there is any utility in his division of that genus into *A*, those with a nymphal callosity on one valve only, of which he gives T. *corbuloides* as an instance, and *B*, those having a callus on both valves, as in T. *pubèscens*. No such distinction is admitted by M. Deshayes, and in several undoubted specimens of T.

corbuloides, examined by me, there is not the slightest dissimilarity in the form of the ligamentary supports in either valve.

In the following monograph of the Thraciæ so far as known to me, I have endeavored to give the synonymy of each species, freed from the erroneous references of previous writers, before the confusion already existing should become inextricable. In prosecuting this attempt, every work referred to has been carefully examined, with the exception of the Dorset Catalogue, and Donovan's British Shells. Notwithstanding the pains which have been taken in comparing the observations of others and tracing each species to its original describer, error may not have been entirely avoided on my own part. Still it is hoped that the present, if not a perfect, is at least a more accurate synonymy than has hitherto been presented.

THRACIA PUBESCENS.

Th. testâ ovato-oblongâ, subventricosâ, inæquivalvi, subæquilaterali, cinereo-albescente, anticè rotundatâ, posticè subtruncatâ et angulatâ, cardine foveolis internis unidentatis instructo.

Mya declivis, PENN. *Brit. Zool.* IV, *No.* 15, *sed* non M. declivis, *Donov.*

Mya pubéscens, PULTENEY, *in Hutch. Dors. Catal.* 27, *tab.* 4, *f.* 6.

Mya (Ligula) pubéscens, MONT. *Test. Brit. p.* 40. *citatione Donovani exclus.*

Mya declivis, MATON and RACKETT, *Linn. Trans.* VIII. *p.* 36, *citat. Donov. exclus.*

Anatina myàlis, LAM. *Anim. sans Vert.* V. *p.* 465, *edit.* 1816, *et* VI. *p.* 80. *edit.* 1835.

Mya declivis, WOOD, *Gen. Conch. p.* 93, *tab.* 18, *f.* 2. *(f.* 3, *exclus.)*

Idem. WOOD, *Index. Testac. tab.* 2, *f.* 4. *Gen.* MYA.

Idem. DILLWYN, *Descript. Catal.* I. *p.* 43, *citatione M. declivi, Donov. et M. convexæ, Wood, exclus.*

Mya pubéscens, TURTON, *Linn.* IV. *p.* 175.

Idem. TURTON, *Conch. Dict. p.* 99, *f.* 35, permediocrè.

Anatina pubéscens, TURTON, *Brit. Bivalves, p.* 45, *tab.* 4, *f.* 3. junior.

Mya declivis, BROWN, *Encycl. Brit.* VI. *p.* 404.

Anatina declivis, BROWN, *Illust. Conch. G. Brit. and Ireland, tab.* 11, *f.* 5, benè.

Anatina myàlis, DE BLAINVILLE, *Man. de Malac. p.* 564.

Thracia pubéscens, DE BLAINV. *ibid. p.* 565.

Idem. DESHAYES, *Encycl. Meth. Vers,* III. *p.* 1039, *No.* 2.

Idem. DESH. *Contin. Lam. Anim. sans Vert.* 1835, VI. *p.* 83, *ubi in synon. pro* Mya pubéscens, *Penn. Brit. Zool.,* Mya declìvis, *Penn. &c. lege.*

Idem. KIENER, *Espèces Gen. et Icon., Gen. Thracia, p.* 5, *tab.* 2, *f.* 2, optim.

DESCRIPTION. Shell ovate-oblong, transverse, subequilateral, inequivalve, right valve somewhat ventricose and the larger, of a reddish-white color, covered with a brown shagreened epidermis, marked with irregular and more or less numerous striæ of increase. The beaks are short, and that of the right valve excavated at its summit to receive the opposite one. The valves are moderately thick, but not wholly opaque, rounded anteriorly, and somewhat truncated posteriorly, with an obtuse ridge, extending from the beaks to the inferior angle of the truncation; cardinal edge rather thin, with a strong, spoon-shaped process on each valve, projecting from just behind the summits obliquely forward and inwardly, and receiving a strong internal ligament; the cavity of this process is divided by a single tooth or ridge, in the outer hollow formed by which, is inserted the external portion of the ligament. The valves, internally, are of a dead white, except outside of the impressions, where they are bright and polished. The anterior muscular impression is long, narrow, submarginal, and contracted near the middle; the posterior is rather large and rounded; palleal impression deeply rounded out, posteriorly.

Length two and a half, height one and three fourths, diameter one and a half inches.

Inhabits the English Channel, North of England shores, and, according to M. Kiener, the Mediterranean.

Observations. This shell was first briefly described by Mr. Pennant in his British Zöology, where he mentions it as common among the Hebrides, by the gentry of which islands its animal is eaten. The species, figured by Mr. Donovan as Mya *declivis*, probably under the idea that it was the same as Mr. Pennant's, is distinct from it although given as a synonym by Maton and Rackett, in their notice of M. *declivis*. Penn., Linn. Trans. VIII. p. 36, and by Montagu, in his Testacea Brittanica, p. 40. That Mya *declivis*, Penn. is identical with his M. *pubèscens*, Mr. Montagu, in his Supplement, assures us there can be no question, remarking, "the specimen of *pubèscens* in the Portland cabinet, from which Mr. P. is said to have originally described his M. *declivis*, is now before us, and we have the satisfaction to declare that it is actually our *pubèscens*." Mya *declivis* of Donovan is Mr. Wood's Mya *convèxa*, a very different shell, and which, from their having no description of it, we may conclude neither Maton and Rackett, nor Mr. Montagu had seen, but supposed from the figure of Mr. Donovan and the name given by him, that it was the *declivis* of Pennant or a variety, and accordingly gave it a place in their synonymy. It has been questioned by some, whether A. *myàlis* Lam. was really this species, but I apprehend a careful examination will leave no doubt of the fact. The description of that author is applicable in every point, unless we object to the term *ventricosa*. But this is often very loosely applied, and if it were not, is not very far from the truth in this particular instance, one valve at least, (the right) being as ventricose as in the majority of species to which that term is given. It should also be borne in mind that Lamarck's specimen of A. *myàlis* was received from Dr. Leach, and therefore in all likelihood, the synonyms were also received from him. As confirmation of this, we may notice that M. Deshayes, in his Article Thracia, Encyc. Meth., states that he had in contemplation the establishment of a genus with the same characters, when he saw in the collection of M. Brongniart, a specimen of A. *myàlis*, also received from Dr. Leach, and labelled by him as Thracia *pubèscens*. M. de Blainville also, although in error as to his specimen being the true A. *myàlis*, seems never to have doubted that shell to be the same as M. *declivis* Penn. It seems, therefore, as if the evidence in favor of so considering it was conclusive.

M. Deshayes, in his continuation of Lamarck, VI. p. 83, has committed a slight mistake in giving Mya *pubéscens* Penn. Brit. Zoöl. as a synonym of T. *pubéscens*. Mr. Pennant has no such shell, and it should read Mya *declivis* Penn. instead of as it now stands. Mr. Wood, in his Gen. Conchology, pl. 18, fig. 3, has figured another species (A. *declivis*, Turton) as the young of this shell, and to this Mr. Turton undoubtedly refers in his remarks on A. *pubéscens*, Brit. Biv. p. 45, when he says "we have been fortunate enough to procure the intermediate sizes of this species, by which we are enabled to clear up all difficulties with respect to the young of the present shell and the Mya *declivis*, Montagu. For Montagu we should here read Wood, as the former has no shell of that name, though his pl. 1, f. 2, represents it. Montagu quotes this figure against his description of M. *præténuis*, a shell which is not truncated posteriorly, as the figure is, and therefore must have been attached to it by mistake. Dr. Dillwyn, in his Descriptive Catalogue, vol. I. p. 43, cites Mya *declivis*, Donov., as a synonym of this species, and considers M. *convéxa*, Wood, as merely a variety more convex than usual. He does not state whether he arrived at this conclusion from a comparison of the shells themselves, or from the general resemblance of the figures. I cannot but think, however, that his opinion must have arisen from the latter, as, if he had ever seen the true M. *convéxa*, he would not have failed to perceive that it differed from Mr. Pennant's *declivis* not only very widely in its external characters, but in the more essential point of the ligamentary supports, which are much narrower and less rounded or spoon-shaped than in M. *declivis*, and are destitute of the tooth-like process in their middle, so remarkable in that shell. The form of the muscular impressions is also different. For these reasons it appears to me that M. *convéxa* Wood, should be stricken out from the synonymy of M. *declivis* Penn. in the Descriptive Catalogue, and also M. *declivis*, Donov.; assuming that Mr. Wood is correct in his reference to it as a synonym of his *convéxa*. Dr. Dillwyn also gives Solen *declivis*, Soland. MSS. in his nomenclature, but as this is a reference that could not be examined in this country at all, and but seldom in Europe, I have omitted it.

It is believed that Thracia *pubéscens* has never been found upon our coast; the shell which Mr. Conrad supposed to be identical with it, proving, on farther examination, to be a distinct species.

THRACIA CONVEXA.

Th. testâ obovatâ, fragili, convexâ, epidermide ferrugineâ scabra tectâ, posticè obliquè angulatâ et subtruncatâ, cardine foveolâ semiovali obliquè prominente valvâ utraque.

Mya declivis, Donovan, *Brit. Shells*, *tab.* 82.

Mya convéxa, Wood, *Gen. Conchology*, *p.* 92, *tab.* 18, *f.* 1.

Idem. Turton, *Conch. Dict.* *p.* 100.

Anatina convéxa, Turton, *Brit. Bivalves*, *p.* 44, *tab.* 4, f. 1 & 2.

Anatina convéxa, BROWN. *Illust. Conch. of G. Brit. and Ireland, tab.* 11, *f.* 3.

Lìgula distórta, MONT., *Test. Brit. Suppl. p.* 166.

Mya convéxa, WOOD, *Ind. Testac. tab.* 2, *f.* 3. Genus MYA.

Thracia convéxa, NOBIS.

DESCRIPTION. Shell obovate, thin, light and brittle, very convex; covered with a thin, ferruginous or ochraceous epidermis, rough to the touch, especially at the posterior extremity; beneath this epidermis the shell is of a chalky white, incremental striæ irregular, and tolerably numerous; somewhat inequilateral, inequivalve, corbuliform, right valve the more convex, and slightly notched at its summit; beaks protuberant; anterior extremity regularly rounded, posterior obliquely subtruncated and narrower; an obtuse ridge or angle extends from the beaks to the lower posterior extremity; basal margin usually curving inwardly in its posterior portion; ligamentary supports semi-oval, narrow, and projecting obliquely inward along the cardinal edge. Interior dull white; muscular impressions remote, the anterior long, narrow and irregular, the posterior tolerably large and rounded, united by a superficial palleal impression circularly excavated posteriorly.

Length two and one-twentieth, height one and twelve-twentieths, diameter one and six-twentieths of an inch.

Inhabits the coast of Devonshire, and western shores of Great Britain, according to Turton and Wood.

OBSERVATIONS. Maton and Rackett, in their Catalogue of British Shells, make no mention of this species, neither is it noticed by Mr. Montagu; and Dr. Dillwyn has considered it merely as a convex variety of Mr. Pennant's Mya *declivis.* It may be reasonably doubted, whether either of these authors ever had the true *convèxa* before them, as they must otherwise have perceived it to be very distinct from M. *declivis*, Pennant, not only in its external characters, (being much more convex, shorter in proportion, thinner, and in a great measure destitute of the asperities so conspicuous in that species), but in the more important character of the form of the ligamentary supports, which, instead of being broad and spoon-shaped, projecting boldly inward, as in M. *declivis*, are formed rather by an internal thickening of the cardinal edge, as in T. *corbuloides*, and are moreover without the dividing ridge, observable in Mr. Pennant's species. Dr. Turton, p. 44 of his British Bivalves, expresses a belief, that the large and very convex light shell described by Mr. Montagu, p. 166 of his Supplement, as Ligula *distòrta*, was this species. This is very probable; indeed, Mr. Montagu himself speaks of his L. *distòrta*, as having been usually confounded with M. *declivis*, Penn. It was first described under the name of Mya *convèxa*, by Mr. Wood, p. 92 of his General Conchology, where he states that it was evidently this species which Donovan figured under the name of Mya *declivis*, from which he affirms Mr. Pennant's shell of the same name to be very distinct. Not having seen Donovan's figure, I cannot determine how far Mr. Wood is correct in regard to that, but think there can be no doubt that he is quite so in considering the shell figured by himself to be distinct. There is but a slight difference in the figures given by Wood, Turton and Brown ; and their descriptions all agree, in the essential particulars, with a fine specimen from the Devonshire coast in my possession, to which hardly a point in the descriptions of T. *pubéscens* is applicable. From T. *Conrádi*, Nobis, this species differs, by its ochreous epidermis, and the form of the posterior extremity, as well as in having that portion of the palleal impression excavated in a more circular form. In other respects they resemble each other considerably, and it would not be strange, if with the plate alone before him, a person should suspect a correct figure of T. *convéxa* to be an indifferent one of T. *Conrádi.* I am not aware that the British species has ever been found on our shores — although, from causes alluded to under the remarks on T. *Conrádi*, it has been usually supposed to exist here.

THRACIA CORBULOIDES.

Plate V. Fig. 1.

Th. testâ ovato-transversâ, griseâ, inæquivalvi, inæquilaterali, bisinuatâ, umbonibus magnis, inferiore emarginatâ. (*Desh.*)

Thracia corbuloides, DESHAYES, *Dict. Class. d'Hist. Nat. tom.* 16, *atlas* 6$^{me.}$ *liv. fig.* 4.

Idem. DE BLAINVILLE. *Manuel de Malac., p.* 565, *tab.* 76, *f.* 7.

Idem. DESH. *Encyc. Meth. Vers,* III. *p.* 1039, No. 1.

Idem. LAM. *Anim. sans Vert. edit. Desh.* 1835, VI. *p.* 83.

Thracia corbuloides, KIENER, *Icon. p.* 4. *Gen.* THRACIA, (*Montacuti citat. exclus.*) *tab.* 2, *f.* 2; *tab.* 1. pro animali.

DESCRIPTION. Shell oval-oblong, transverse, somewhat ventricose, sub-diaphanous by reason of its little thickness; inequilateral, the posterior side being the longer, very inequivalve, corbuliform, right valve the larger, covered with a thin, strongly adherent, dark grey epidermis, very rough to the touch, in consequence of a minute granulation which covers the whole surface, and under a magnifier resembles shagreen; beaks large, protuberant and cordiform, curving slightly backwards, the summit of the right one excavated to receive that of the left. The cardinal edge is thin, having on the posterior side a nymphal callosity, projecting inwardly and receiving a ligament partly internal and partly external. The anterior extremity is rather obtusely rounded, basal margin with rather a prominent outward curve in its middle portion, posterior extremity broadly and irregularly truncated, somewhat compressed; an obtuse ridge extends obliquely from the beaks to the lower posterior margin, and on the right valve a rather less prominent ridge runs from the beak to the middle of the truncation. The incremental striæ are frequent, irregularly concentric, forming occasional ridges, which are most conspicuous at the truncated extremity. The internal color is milk-white and glossy, except toward the margin, outside of the palleal impressions. Anterior muscular impression long and narrow, with a sort of indentation at its upper end; posterior rather small, irregularly rounded, and situate near the superior extremity ; they are both rather superficial, and connected by a palleal impression deeply and circularly indented posteriorly.

Length two and a half, height one and three quarters, diameter one and a quarter inches.

OBSERVATIONS. Found living in the Mediterranean, and fossil in the Island of Sicily. It is believed that the only errors relative to the synonymy of this species, are the reference to it by Mr. Conrad, in his American Marine Conchology, p. 44, as a synonym for the one found on our coast, and Kiener's misquotation of MYA *distórta*, Mont. This latter must have arisen from his deciding by an examination of the figures only, of Mr. Montagu's shell, as, had Kiener ever read any of the various descriptions of it, he would have been aware that one of the constant characters ascribed to it, is the anterior extremity being rounded instead of truncated ; a distinction sufficient, apart from its other peculiarities, to mark a specific difference. After a careful examination of the descriptions and figures of British authors, I feel convinced that T. *corbuloides*, Deshayes, does not exist, or at least has not been found, upon the coast of Great Britain. The description here given is taken chiefly from M. Deshayes, with several additions, from a very fine specimen before me, of characters omitted by him. He describes the exterior surface of the valves as *lisses*, or smooth ; but this can only be the case where the granular asperities have been accidentally effaced, as it is not merely on the epidermis, but in the shell itself that these are visible when the specimen is fresh. In his remarks, Encyc. Meth. III. p. 1039, he observes, that he is ignorant whether this shell has an ossiculum or not, but thinks there are traces of its existence. In a number of very perfect specimens examined by me, the valves of some of which had never been separated, none was found, neither was there the slightest appearance of any impression on the shell indicative of its ever having been present. We may reasonably conclude, therefore, that it does not exist in this species. It is certainly much to be regretted, that M. Deshayes has neglected to mention upon what species of Thracia he observed this appendage.

THRACIA PLICATA.

Th. testâ ovato-oblongâ, transversâ, æquilaterali, inæquivalvi, depressâ, transversim plicatâ, compressâ, albâ. (*Desh.*)

Thracia plicàta, DESH. *Encyc. Meth. Vers*, III. *p.* 1039, No. 3.

Idem. LAM. *Anim. sans Vert. edit. Desh.* 1835, VI. *p.* 83.

Idem. KIENER, *Iconog.*, *Gen.* THRACIA, *p.* 6, *tab.* 2, *f.* 3.

DESCRIPTION. Shell oval-oblong, transverse, equilateral, inequivalve, compressed; beaks small, and slightly prominent; valves thin and brittle; anterior extremity rounded, posterior obliquely truncated, and bounded on the outside by a very obtuse angle, extending obliquely from the beaks to the junction of the posterior and basal margins. The exterior is strongly marked by transverse, rounded, undulating plaits, their number varying somewhat in different individuals. The cardinal edge is delicate, and each valve is furnished with a small horizontal, triangular, tolerably thick projecting support, for an internal ligament, which is slightly visible on the exterior. Externally, the valves are smooth, white and polished, like the interior. The anterior muscular impression very superficial, elongated, and very narrow, is united to the posterior, which is small and rounded, by a palleal impression strongly excavated posteriorly.

Length one and a half inches, height one inch.

This species, wholly white, is exceeding rare in collections. I have never seen but two valves, and their locality is unknown. A fossil analogue is found in the vicinity of Bordeaux, but is quite rare. (*Deshayes.*)

THRACIA PHASEOLINA.

Th. testâ ovato-oblongâ, transversâ, subdepressâ, subæquilaterali, inæquivalvi, albâ, subdiaphana, transversim tenué striatâ, latere postico breviore, angulato, truncato.

Amphidésma phaseolína, LAM. *Anim. sans Vert.* V. *p.* 464, ed. 1816.

Thracia phaseolìna, KIENER, *Iconog.*, *Gen.* THRACIA, *p.* 7, *ref. ad. tab.* 1, *f.* 2, *Mont. exclus.*

DESCRIPTION. Shell ovate, oblong, transverse, *sub*-equilateral, inequivalve, beaks small, the left one slightly notched. The valves are white, *sub*-diaphanous and smooth, indistinctly marked with striæ of increase, rounded at the anterior side, strongly truncated at the posterior side; this side is bounded *externally* by an obtuse angle, pretty prominent, extending obliquely from the beaks to the lower part of the shell. The cardinal edge is thin and without teeth; it presents upon the posterior side of the beaks, a small internal, short, *sub*-triangular, hollow *process*, in which is attached a small internal ligament, visible externally. The valves are white and shining internally. The anterior muscular impression is elongated, the posterior is rounded and united to the anterior, by a palleal impression deeply notched *posteriorly*. (*Kiener*, *Storer's transl.*)

Length twenty-two twentieths, height twelve twentieths, diameter eight twentieths of an inch.

OBSERVATIONS. This species, according to M. Kiener, is found at Cherbourg, and the Mediterranean, and also at Falmouth, in England. In all probability, however, this last locality is incorrect. His reference to Mr. Montagu's figure is also, I think, erroneous, that being, according to Dr. Turton, a correct representation of his ANATINA *declivis*, a different species, as will be shown hereafter. The tooth also, it may be observed, of Mr. Montagu's figure, is very different from the tooth or apophysis for the ligament, in T. *phaseolina*. In consequence of not detecting the circumstance that the figure of Mr. Montagu refers to one shell, and his description by some accident to another, Mr. Kiener, misled by that author's observations, supposes T. *phaseolina* to have been known to Mr. Petiver, when in fact, the shell spoken of by Mr. Montagu, as first described by that writer as the "white spoon-hinge" (CHAMA *prætenuis*, Petiver, *Mus. tab.* 94, *fig.* 4. ANAT. *prætenuis*, Turton, &c.)

does not belong to the same genus, but to our genus COCHLODESMA. His reference to AMPH. *phaseolina* Lam., is doubtless correct, as he had access to the collection of that eminent naturalist, in which the species described by him were labelled by his own hand. Notwithstanding the great similarity in Mr. Kiener's description of this shell and that by M. Deshayes of the preceding species, they are essentially different. Having been enabled to compare perfect specimens of both, I would point out some of the differences as follows: T. *plicàta* is more broadly truncated, thinner, its height greater in proportion, and the valves, which in T. *phaseolìna* are only feebly striated by the lines of increment, are covered with numerous elevated, undulating, transverse, rounded ridges, giving the exterior an appearance somewhat like that of LUTRARIA *Campeachénsis*, Wood's Ind., of our southern coast. Its whiteness is also peculiar to itself, being a sort of polished chalk-white, without the yellow tinge prevailing in the generality of shells. The specimen of T. *phaseolina* in my collection was received from the Mediterranean. It is moderately convex, somewhat attenuated posteriorly, and very abruptly truncated, with the carination strongly marked. The summits are a little pearly. The interior of the valves is *not* shining, except near the margins. That portion of the description in italics denotes additions to Kiener's description, from the shell before me.

THRACIA SIMILIS.

Plate IV. fig. 3.

Th. testà ovato-oblongà, asperà, albidà vel cinereà, subdiaphanà inæquilaterali, latere postico longiore, truncato et subcompresso, angulo obtuso ab apice ad marginem infero-posticam decurrente; cardine foveolà subtriangulari, valvà utraque ligamento externè prominulo; intus albà, impressionibus muscularibus anticè elongatis, quasi clavatis, posticè rotundatis; impressio pallii posticè valdè excavatà; an ossiculum?

Shell ovate-oblong, semi-transparent, of a greyish white, or ash color, ferruginous at the margins, moderately convex, covered with numerous pretty regular, concentric striæ of increment, and feeling rough to the touch, in consequence of being covered with minute granulations, most conspicuous near the margins and on the truncated end; a very thin, grayish epidermis, strongly adherent, and hardly to be distinguished from the shell itself, extends over the whole surface; somewhat inequivalve, the right valve a little the larger and projecting beyond the left; beaks moderately prominent, inclined a little backwards, the summit of the left one acute, and fitting into that of the right valve, which is excavated to receive it; slightly gaping at both extremities, inequilateral; the posterior extremity, which in some individuals is almost twice the length of the anterior, is broadly truncated, a little narrowed, and that portion between the dorsal margin and the obtuse wave, which extends from the beaks to the lower extremity, is somewhat compressed; the anterior extremity is oval, the basal margin regularly but not very strongly curved; cardinal edge delicate, ligamentary supports short and subtriangular, showing a slight impression on their inner surface, as if an ossiculum might once have been attached to the internal ligament, which is thick and strong; the external ligament is small and slightly prominent; posterior dorsal area broad, and strongly marked, extending from the beaks nearly to the extremity. The interior is nearly pure white, not glossy, though exhibiting a slightly nacred appearance; anterior muscular impression elongated, simple, club-shaped, posterior one small and very regularly rounded; palleal impression very deeply indented posteriorly.

Length one and two-twentieths, height fourteen twentieths, diameter eight twentieths of an inch.

Inhabits the shores of Brazil.

In my collection and that of the Boston Soc. of Nat. History.

OBSERVATIONS. This species, not heretofore described, was obtained from a seaman who assured me that he procured it containing the animal, on the coast of Brazil, not far from Rio de Janeiro. It has a close affinity to T. *corbuloides*, Deshayes, in its general aspect and the rough feeling like shagreen, so conspicuous in that shell; but differs externally in being much less inequivalve, destitute of the prominent ridge in the centre of the valves, and in having only a single obtuse ridge on the truncated extremity instead of two; internally, it differs in the structure of the ligamentary apophysis, which is much shorter, but at the same time broader, and of a more triangular shape than in T. *corbuloides*. The anterior muscular impression also is simple or entire, instead of being, as in that species, double or divided in two portions.

Its outline also approaches that of T. ***phaseolìna***, Kiener, but it is readily distinguished by its roughness, and the very apparent striæ of growth which almost form plaits on the extremities. T. ***phaseolìna*** on the contrary, is quite smooth and the striæ hardly perceptible.

It appears to vary considerably in its external appearance, contour, &c., as in two specimens in my possession, one is considerably longer than the other in proportion to its height, and more irregular in its outline. This variety has some likeness to the figure given by Dr. Turton of his ANAT. ***truncàta*** Brit. Biv. tab. 4, f. 6, the right valve having something of a truncated aspect, anteriorly as well as posteriorly.

Of the existence of the ossiculum spoken of by M. Deshayes, there appears some trace in a slight impression, visible on the under or inner surface of the ligamentary apophyses, and it is possible one may have been attached, and displaced through want of knowledge in the person who removed the animal. Still, this is very doubtful, as the specimens were otherwise very perfect, the thin membrane which lines the interior of the shell still remaining upon it, and in one the ligament was not in the slightest measure injured, great caution evidently having been used in taking out the animal.

THRACIA CONRADI.

Plate IV. fig. 2.

Th. testâ albo-cinerescente, ovato-transversâ, ventricosâ, subæquilaterali, fragili, paullum hiante, margine sinuato, anticè rotundatâ, posticè subtruncatâ, carinâ obtusâ, ab apice ad marginem infero-posticam decurrente, ligamento externè prominente, internè callo nymphali valvâ utraque inserto.

Thracia declìvis, CONRAD, *Amer. Mar. Conch. p.* 44, *tab.* 9, *fig.* 2. *Synon. omn. exclus.*

Anatìna convéxa. Catal. Animals and Plants of Mass. 1834, *p.* 25.

DESCRIPTION. Shell transversely ovate, ventricose, very light, brittle and thin, rather faintly diaphanous by reason of its want of thickness, subequilateral, slightly gaping at both extremities, inequivalve, the right valve being the more convex, its whole margin projecting considerably beyond that of the left; beaks protuberant, large and cordiform, inclining a little backwards, the summit of the right one excavated or emarginate to receive the opposing one; incremental striæ numerous and distinct, occasionally forming feeble concentric ridges; the anterior portion of the shell is regularly rounded, and its superior margins very thin; the posterior extremity is rather narrower and somewhat truncated, with an obtuse carination extending obliquely from the beaks to the angle of the basal and posterior margins; between this carination and the superior and posterior margins, the shell is slightly compressed. The basal margin is sinuous, curving outwardly in its central portion, correspondent to the most convex part of the shell. Ligament, externally, very prominent, and prolonged in a thin membrane the whole length of the corselet, which is strongly marked and extends from the beaks to the extremity ; the internal portion of the ligament is attached to a strong, thick, nymphal callosity, projecting obliquely along the cardinal edge in each valve, wider toward the beaks, and having its surface but very slightly hollowed. Hinge destitute of a cardinal ossiculum. External color a pale ashy-white, surface covered with a thin, light cinereous epidermis, strongly adherent and forming numerous irregular, minute corrugations at the extremities, especially on the posterior one, but not shagreened as in T. *corbuloides.* Internal color a chalky white, not glossy, but somewhat inclining to nacre near the cardinal edge. Muscular impressions tolerably large, remote, the anterior narrow, elongated, contracted and tapering to a point towards the hinge margin ; the posterior sub-triangular or pyriform ; palleal impression very superficial like the others, with a profound, sub-angular excavation posteriorly.

Length two and eighteen-twentieths, height two and four-twentieths, diameter one and six-twentieths inches.

Inhabits probably the whole coast of New England.

Observations. Single valves of this shell are occasionally met with, along the whole coast of New England, but perfect specimens are extremely rare. The beach at Chelsea is the only locality, within my knowledge, where such have been found. Of late years several have been procured at this place, shortly after the breaking up of the ice ; cast up by the heavy sea which during the violent easterly gales of winter, rolls in upon this part of the coast, covering it with marine plants and fragments of shells, many of them thrown up from great depths, and never seen at any other season. It was during an excursion thither at this time, that I procured a gigantic specimen of SOLEMYA *boreàlis*, Totten, measuring four and a half by one and three-fourths inches, now in the Society's collection. A single valve of LUCINA *ràdula*, Lam., not previously known to exist on our shores, was found last spring attached to the root of Laminària saccharina, among which, it may be mentioned, are frequently found CHITON *fulminàtus* and C. *sagrinàtus* Nob., which I have nowhere else seen alive.

The specimen of Thracia serving for the preceding description, was obtained in the early part of March last, with the living animal. It was buried about six inches below the surface, at low-water mark. An accident deprived me of an opportunity to examine the animal, and repeated visits in search of another have been wholly unsuccessful.

This shell was described some years since by Mr. T. A. Conrad, of Philadelphia, in his American Marine Conchology, as THRACIA *declìvis*, under the supposition that it was identical with MYA *declìvis*, Penn., and the synonyms given as follows:—

Mya declìvis, PENN., *Brit. Zoöl, vol.* IV. *p.* 79.

Lìgula pubéscens, MONT., *Test. Brit. p.* 40.

Mya convéxa, WOOD, *Gen. Conch. p.* 92, *tab.* 10. *f.* 1.

Anatìna myàlis, LAM., *Anim. sans. Vert. vol.*V. *p.* 464, (*old edit.*)

Thracia corbuloides? BLAINVILLE. *Man. de Malac. p.* 565, *tab.* 76, *f.* 7.

It appears that Mr. Conrad was then not aware that Dr. Leach had made the shell first named above, the type of his genus Thracia, under the name of T. *pubèscens*, which of course would have taken precedence of the latter specific name, admitting our shell and Mr. Pennant's to be identical. They are, however, distinct; and it also appears proper that our species should receive another name, as that given it by Mr. Conrad is evidently liable to mislead the foreign naturalist, and introduce fresh confusion. Besides having mistaken ours for the British shell, Mr. Conrad has given the names of three distinct species as synonyms. He seems to have suspected M. de Blainville's figure of T. *corbuloides*, and Mr. Wood's of MYA *convèxa*, to represent the same shell, and then to have confounded these with An. *myàlis*, Lamarck, from whom the rest of the synonymy is taken. Yet how this could be the case is not easy to imagine, as on the same plate where Mr. Wood gives a figure of M. *convèxa*, he gives another of M. *declivis*, which has no resemblance to ours. Even without reference to the figures, one would suppose Lamarck's comparison of A. *myàlis* to MYA *arenària*, certainly not applicable to our Thracia, sufficient to have induced a doubt of their identity. Mr. Conrad, however, is not alone in supposing ours to be the same as one of the European species. In Professor Hitchcock's catalogue of the Animals and Plants of Massachusetts, accompanying his Report on the survey of the State, published in 1834, it is noted, p. 25, as An. *convèxa*, Wood. Subsequently, on the appearance of Kiener's Iconography of recent shells, after an examination of his figures, it was decided to be identical with

T. *corbuloides*, Deshayes, under which belief Dr. Storer, in his excellent translation of that work, speaks of this latter species in a note, page 4, article THRACIA, as existing along the whole coast of New England. The close resemblance, in the outline of our shell, to the figure of Kiener, rendered this conclusion almost unavoidable, without an opportunity of comparing the shells themselves. Through the kindness of Dr. J. C. Jay, of New York, I am in possession of a fine specimen of T. *corbuloides*, from the Mediterranean, which differs from T. *Conrádi* in the following essential particulars: it is more elongated in proportion to its height, much more inequilateral, more broadly and unevenly truncated, and externally covered with fine granulations, making it rough to the touch, (not unlike fine sand-paper,) which is not the case with ours at all, except near the beaks, and there hardly perceptible.

But the difference most to be relied upon, and in fact sufficient in itself to warrant a distinction, because it manifests a different conformation in the animals, is that of the muscular and palleal impressions. The posterior muscular impression, both in the shell before me and as represented in pl. 76, f. 7, Man. de Malac., is small and irregularly rounded, and the palleal impression, as shown by the plate, is excavated posteriorly in an irregular, and in the specimen in a regular semicircular form; whereas, in T. *Conrádi*, the first is subtriangular or pyriform, and the latter forms posteriorly a deep and almost acute angle.

T. *convéxa* differs from our species in the shape of its ligamentary supports, is covered with a rough, ferruginous or ochraceous epidermis, not existing in T. *Conrádi*, and its basal margin, instead of curving outwardly near the middle, a constant peculiarity of our shell, has always an inward curve at that part. From T. *pubéscens*, ours differs in every essential particular, and could not, with any figure of that shell, be mistaken for it.

From having observed several specimens which yet contained the animal, either in a state of partial decomposition, or dried in the shell, I am enabled to state with certainty, that the cardinal ossiculum, mentioned by Deshayes as found upon some species, has no existence in ours, which nevertheless possesses all the other characters of the genus as expressed by him.

The size here given is about an average one, though specimens have been found measuring a third more.

Besides the species of Thracia here described, there are several shells classed by Dr. Turton among the Anatinæ, and by Mr. Montagu, included in his genus LIGULA, which may possibly hereafter be found to belong to the Thracia. ANATINA *declivis*, Turton, is one of these. He states, p. 45, of his Bivalves, that it had usually been confounded with the young of MYA *declivis*, Penn., but that he had been enabled, by obtaining the intermediate sizes, to clear up all difficulties relative to the young of that shell and M. *declivis*, Montagu. Now, as Mr. Montagu has no species of that name, the difficulties are increased instead of cleared up, by Dr. Turton, who has added still more to the confusion, by giving, in his Conchological Dict. p. 98, MYA *præténuis*, Penn., as a synonym of this species, when it is also, p. 101, given as a synonym of his and Mr. Montagu's MYA *prætnuis*, and of his Anat. *præténuis*, p. 48, of his Bivalves. If Dr. Turton was correct in judging his A. *declìvis* to be distinct, it is evident that M. *prætènuis* should be struck from the synonymy in his Dictionary. He also refers to tab. 18, f. 3, Wood, Gen. Conch., figured as the young of M. *declivis*, Penn., and to tab. 1, f. 2, Mont. Test. Brit., for figures of his A. *declìvis*. It is impossible, without reference to the very shells which were before the authors, to clear up or decide upon confusion like this.

Capt. Brown, in his Conch. Illust. of Great Britain and Ireland, represents, tab. 11, f. 6, under the name of Anat. *villosiùscula*, a shell closely resembling Mr. Montagu's figure in all but the form of the tooth, and refers it to McGillivray, Phil. Journ. tab. 1, f. 10, 11. This latter work is not accessible to me, but if Capt. Brown's figure may be relied upon, and considering his remark that it has usually been mistaken for the young of M. *declivis*, (T. *pubèscens*), there is every reason for believing it a true Thracia. It may possibly be identical with Dr. Turton's A. *declìvis*. Capt. Brown's figure might, at first sight, be mistaken for a representation of Th. *similis*, Nobis, but it will be observed, that the anterior extremity is the longer, instead of the posterior, as in that species.

With regard to Mya (Ligula) *distórta*, Montagu, tab. 1, f. 1, referred to by M. Kiener, for T. *corbuloides*, Deshayes, I suspect it will be eventually found to belong among the perforating Corbulæ, to which I am also inclined to refer Anatina *truncàta*, Turton, British Biv. p. 46, tab. 4, f. 6, both species having similar habits of burrowing in the limestone of the British coast.

Never having seen the shells themselves, however, it is, of course, out of my power to decide this point with certainty.

Genus PERIPLOMA, Schumacher.

GENERIC CHARACTERS. Shell very thin and brittle, transversely oblong, inequivalve, corbuliform, ***right valve the more convex***, very inequilateral, posterior side short, subtruncated, and but slightly gaping, hinge edentulous, an oblique, projecting, spoon-shaped process on each valve forms with the anterior cardinal edge a deep sinus, in which is inserted a flat ossiculum, of a semicircular or sub-triangular shape, retained in its position by a small portion of the ligament, which is double, the external portion anterior, very thin or membranous, the internal strong and contained in the cardinal processes. Muscular impressions remote, anterior long and narrow near the cardinal edge, posterior small and rounded ; palleal impression deeply indented posteriorly. Interior subperlaceous.

PERIPLOMA TRAPEZOIDES.

P. testâ rotundato-quadratâ, convexâ, tenui, pellucidâ, lævigatâ, dente cochleari obliquato. (*Lamarck.*)

Córbula. *Ency. Meth. tab.* 230, *f.* 6, *a. b.*

Anatina trapezoides, LAM., *Anim. sans Vert. edit.* 1818, V. *p.* 464.

Periplòma inæquivàlvis, SCHUMACH. *Essai d'une Syst. de Conch. p.* 115, *tab.* 5, *f.* 1, *a. b.*

Osteodésma trapezoidàlis, Blainv., *Mal. p.* 660, *delineata, tab.* 76, *f.* 8. *sub nom.* Anatina *trapezoides.*

Periplòma, Rang, *Man. des Mollus. p.* 325. *Synon. pro genere exclus.*

Periplòma trapezoides, Desh., *Encyc. Meth. Vers,* III, *p.* 739.

Idem. Desh., Lam. *Anim. sans Vert. edit.* 1835, *p.* 81.

Description. Shell very thin and fragile, transverse, sub-quadrangular, very inequivalve, corbuliform, right valve the larger and quite ventricose, left valve opercular and nearly flat; extremely inequilateral, posterior side much the shorter, both extremities sub-truncated, the anterior in its whole extent, the posterior in its lower portion; anterior cardinal edge nearly rectilinear, the basal margin parallel to it, the posterior declining rather abruptly to the commencement of the truncation; the hinge is without teeth, but each valve is furnished with a strong, spoon-shaped process, projecting obliquely forward, and forming, with the anterior cardinal edge, a profound sinus, which receives a thin, flattened, semicircular ossiculum, fitting in edgewise with the convex edge outermost, the inner edge a little concave, so that when the valves are opened, the extremities of this appendage are in a manner hooked under each cardinal edge. The ligament is twofold, the internal one being very strong, and inserted into the cardinal processes, while the external is nearly membranous, and remarkable for being placed anteriorly, instead of posteriorly, as in almost all other shells. A carination, rather sharply defined, on the right valve and indistinct on the left, extends obliquely from the beaks to the lower angle of the posterior extremity. The beaks moderately prominent, and inclining a little backwards, exhibit a singular appearance, the anterior portion of their summits having the outer coat or layer of calcareous matter, as it were perpendicularly cut through, projecting a little over the posterior side (which is somewhat pearly), and terminating in a sharp angle. Externally, the shell presents very numerous fine, but distinct incremental lines, and is covered with a thin, adherent, light-brown epidermis, most apparent near the margins. Viewed under a lens, the external surface is seen to be covered with very minute, irregularly disposed granulations, similar to, but much finer and closer than those observed upon the Thraciæ. Seen in profile the outline is sinuous, the extremities of the shell being inflected in opposite directions. That portion of the interior, within the muscular and palleal impressions, is of a dull, unpolished white, except in the cavity formed by the beaks, where, like the remainder, it exhibits a pearly lustre. The muscular impressions are rather superficial, the anterior is near the cardinal edge, long and narrow, the posterior remote, small and rounded, palleal impression deeply excavated posteriorly.

Length twenty-four-twentieths, height sixteen-twentieths, diameter ten-twentieths of an inch.

Inhabits the coast of Brazil, on the statement of the person who brought the shell hither.

Observations. This very singular shell is the only species yet known of the genus. The error committed by M. de Blainville, in confounding it with genus

Osteodesma, Deshayes, and supposing it identical with Lamarck's **Anatina** *myàlis*, has already been referred to. The present purpose is to point out another serious error of that naturalist, in his generic description, which it is the more important to correct, since, like the first mentioned, it has been adopted by M. Rang, in his Manuel des Mollusques, p. 325.

It consists in stating the shell to be "inéquivalve, la valve *gauche*, plus bombée que la droite," when the reverse is the case, and it should read "la valve *droite* plus bombée que la gauche." It might be supposed that this was a misprint only, did we not find the same mistake repeated on plate 76, f. 8, a, to which figure he refers at the bottom of the plate as "montrant la pièce calcaire du tègument sur la valve *droite*," when in fact it is the *left* valve which is represented. It is difficult to conceive by what strange inadvertence, an observer so accurate as M. de Blainville, could have repeated an error of this nature; when a glance at the impressions, even as represented fig. 8, of the same plate, would have made it apparent at once; unless indeed he was misled by the peculiar position of the ligament, which is not spoken of either by himself, or any of the others who have characterized the genus. It is not the less certain, however, that this peculiarity does exist, as is sufficiently apparent in the specimen before me, from which the preceding description was drawn up. M. Deshayes speaks of the ossiculum as triangular, but in the very fresh and perfect shell under observation, (for the opportunity of examining which, I am indebted to the kindness of the President of this Society, to whose collection it belongs,) it is very nearly a complete semicircle. M. de Blainville characterizes it as transverse, which gives at best a very imperfect idea of its structure. In fact, judging from his description and that of M. Rang, unassisted by figures, a person with the very shell in question before him, might well be excused for considering it distinct, or at all events hesitating in his decision. Since many in this country, are from lack of the means of comparison, likely to be thus confused, and as M. Deshayes, in his recent edition of Lamarck, has not corrected the error relative to the valves, merely stating them to be dissimilar, nor spoken of the unusual position of the external ligament, I have thought these points of sufficient importance to demand a new and more accurate characterization of the genus, which accordingly I have endeavored here to give. It should also be observed, that the division B, of M. de Blainville and M. Rang, founded on Anatina *rupicola,* Lam., genus Rupicola, Fleur. de Bellevue, should be suppressed, that shell having since been ascertained to belong to the perforating Corbulæ. The generic synonomy of Rang also, for reasons already specified, should be stricken out.

On account of the contradictory statements respecting this shell, and, as is believed, no full description of it ever having been given, it was thought advisable to present the detailed one preceding these remarks.

There is still one point of difference between M. Deshayes and M. de Blainville, in relation to this species, which cannot be cleared up on this side of the water. The former, in his continuation of Lamarck, VI. p. 76, 77, remarks that "in the Anatina *trapezoides,* of which Bruguière made a Corbula, and on which M.

Schumacher founded his genus Periploma, the cardinal ossiculum is in the form of a wedge, placed between the dorsal edge and the supports, and the summits are not cloven." M. de Blainville, on the contrary, speaks of and represents them as cloven, and they certainly are so in the specimen before me; the form of the ossiculum is also semicircular or transverse, instead of cuneïform. Still, M. Deshayes gives it as a synonym of A. *trapezoides*. It would be singular if he were in error in this also, and the shell described by M. de Blainville and in this paper, should prove distinct from A. *trapezoides*, the CORBULA of Bruguière's plate 230, fig. 6, a, b, which figure certainly countenances, in a degree, this supposition. This must, however, be decided elsewhere. I have here taken the synonymy of M. Deshayes as correct.

Genus OSTEODESMA, Deshayes.

GENERIC CHARACTERS. Shell oblong, transverse, trigonal, thin, inequivalve, slightly gaping at its extremities. Hinge linear, having on each valve a very narrow apophysis, firmly adherent along the superior or dorsal edge of the valves; a quadrangular ossiculum is supported between these apophyses by the ligament, to which it adheres by all its upper surface. Muscular impressions small, the anterior elongated, the posterior rounded. Palleal impression excavated posteriorly. *(Deshayes.)*

OSTEODESMA HYALINA.

Mya hyalina, CONRAD, *Journ. Phil. Acad. Nat. Sci.* VI. *p.* 261, *tab.* 11, *f.* 12.
Osteodésma hyalina, NOBIS.

OBSERVATIONS. Turton, in his British Bivalves, p. 34, establishes a genus under the name of LYONSIA, the characters of which are founded on MYA *Norvégica,* CHEMNITZ and others, AMPHIDESMA *corbuloides,* LAM., the same shell which is given by Deshayes as the type of his OSTEODESMA. According to Brown, in his Illustrations of the Conchology of Great Britain and Ireland, Dr. Leach had given in manuscript a genus MAGDALA also, for this shell, of which there is a representation, plate 11, f. 1, 2, 10, of that work, under the name of MAGDALA *striàta.* Turton has described and figured it, p. 35 of his Bivalves, plate 3, f. 6, 7.

The generic appellation of M. Deshayes, from its being so expressive of the distinguishing feature of the shell, as well as from the genus constituting one of his family of Osteodesmacea, which includes those genera founded upon the various modifications of the ossiculum, will undoubtedly, in the end, take precedence of the names of either Turton or Leach. In his recent edition of Lamarck, that author speaks of his knowledge of five species, all recent, very thin and fragile, covered with an epidermis in most cases of great delicacy, beneath which the valves are perlaceous. This epidermis is sometimes, however, tolerably thick, and extends beyond the margins. The ligamentary apophyses, (we have no word conveying literally the idea of the term "*cuilleron*") are very narrow, and adhere closely, along the posterior cardinal edge, which is a little depressed or indented in that portion. They are not exactly parallel, but diverge a little from the beaks toward the posterior extremity. In conformity with this divergence, the ossiculum which covers them, instead of being, as in all the rest of the family, at one of the extremities, is irregularly oblong, and in some cases almost cuneïform, the narrower end being next the beaks. M. Deshayes observes, that Lamarck's MYA *solemyális*, from the shores of New Holland, is an undoubted Osteodésma.

As this genus is very little known to American naturalists generally, in consequence of its erroneous suppression as identical with PERIPLOMA, by M. de Blainville and M. Rang in their "Manuels," I have been induced to give its true characters in this place, in hopes that should any additional species be discovered hereafter, upon our shores, farther confusion may be avoided.

This appeared the more advisable, because, although M. Deshayes, in his article PERIPLOMA, Encyc. Meth. Vers, III. p. 739, in noticing the mistake of M. de Blainville, refers us to his article on OSTEODESMA for its actual characters; yet, by a singular oversight, that article is entirely omitted. Consequently, the only work in which a generic description may be found is his recent edition of Lamarck, of which there are probably but few copies at present in the country.

The species found on our shores, has been thought by some to be the same as that inhabiting the Northern coasts of Europe, and known to the earlier writers as MYA *norvégica*,—Amphidésma *corbuloides*, Lam. It is very distinct, however, the European shell being nearly or full twice as large as ours, more elongated, more broadly truncated, more inequilateral, the basal margin less regularly curved, thicker, and covered with a much stronger and more opaque epidermis.

Since the foregoing remarks were written, Dr. Gould has informed me, that several years since, he observed the peculiarity of the ossiculum in O. *hyalina*, and referred it in consequence to genus LYONSIA, Turton. It is noted in the Catalogue of Animals and Plants of Mass. *p.* 25, as AMPHIDESMA *corbuloides*, Lam.

M. Deshayes having formed his Family Osteodesmacea, to embrace such shells as are furnished with an ossiculum of some form or other, supported at the hinge by a portion of the internal ligament, and having, in its arrangement, restricted the Anatina proper to such as have it anterior and tricuspidate; it happens that several species, formerly included in that genus, and closely allied to it under the present system, have no place assigned them in his classification.

I allude to those shells which are furnished with an internally projecting, spoon-shaped process for the reception of the ligament; having supporting costæ as in the Anatinæ, but destitute of any ossiculum, and much more compressed or telliniform than any of that genus, as now recognised. Their animal, also, differs materially from that of Anatina in the form of the siphons, which are separate in their whole extent, and in the shape of the foot.

As the method of Deshayes will probably prevail, in this country at least, and, whether such is the case or not, there being no valid genus existing, to which the species in question can be referred; it is proposed to supply the deficiency by the creation of a new genus for their reception, under the name of Cochlodesma, to follow immediately in the suite of M. Deshayes's family Osteodesmacea. Should this be adopted, it will receive several shells formerly classed by Mr. Montagu, in his genus Ligula, which was so loosely characterized, and embraced species differing so widely in generic traits, that it is believed to have been adopted by no subsequent author. M. Deshayes, in noticing it in his continuation of Bruguière's Vers, Encyc. Meth., gives as a reason for its suppression, that it is "synonymous with Amphidesma, which has supplanted it." This is a mistake however, as, although it included some of that genus, it also contained several Thraciæ, and the Mya *prætenuis* of Pennant and others, which is assuredly not an Amphidesma, but will probably be found to pertain to our genus Cochlodesma.

It was unfortunately, not in my power, at the time of obtaining the specimens which served me for characterizing the genus; to procure any having the animal sufficiently perfect for minute details. They were picked up on the beach near Sandy Hook, at the entrance of New York harbor, after an easterly gale, chiefly in a half dried state; and although on immersion in water all the firmer parts were clearly developed, the branchiæ were so mutilated that their structure could not be ascertained. As it is found living on the shores of Cape Cod, it is to be hoped that some one will examine the animal, and supply the deficiency here existing. The characters of the genus, so far as can at present be determined, are as follows:

Genus Cochlodesma, Couthouy.

Animal oval, compressed, enveloped in a thin mantle, closed by a membrane in front, except at the anterior inferior extremity, where it opens to give passage to a broad, compressed foot, extending along the whole inferior surface of the abdominal mass, which is inconsiderable; edges of the pallium thickened and a little rugose; siphons, long, slender, divided in their whole extent, and opening separately into the branchial cavity. Branchiæ?

Shell transversely oval, thin and fragile, subequilateral, convexo-depressed, slightly gaping at both extremities, inequivalve, right valve the more convex, beaks moderately prominent, inclining a little backwards, summits cloven and sub-nacrous posteriorly; extremities rounded. Ligament double, the external very slight and membranous, the internal received into a horizontal, spoon-shaped process on each valve, supported by one or two divergent, falciform costæ, projecting from it obliquely and posteriorly; muscular impressions superficial, remote, the anterior elongated-oval, the posterior small and subtriangular, united by a palleal impression profoundly indented posteriorly.

Cochlodesma Leana.

Synonyms. Anatina Leána, Conrad, *Journ. Acad. Nat. Sci.* VI. 263.
Cochlodésma Leána, Nobis.

OBSERVATIONS. The figures and descriptions given by British authors of CHAMA *præténuis*, Petiver, MYA *præténuis*, Pennant, Donovan, Wood, Dillwyn, Turton, (*Conch. Dict.*) LIGULA *præténuis*, Montagu, [*Suppl.*], ANATINA *præténuis*, Turton (*Bivalves*) and Brown, seem to answer so closely to Mr. Conrad's shell, that it appears doubtful to me whether they are not identical. This cannot however be determined with certainty, without a comparison of the shells themselves, which it is not possible to make at present. If the *præténuis* prove specifically distinct from the *Leána*, there is no doubt of it being generically the same, and it should therefore be received as C. *præténuis*, mî.

In this instance, as in many others, we can only regret that we are so deficient in the British shells, and especially the marine ones. Should these remarks meet the eye of any naturalist in England, who would take the trouble to forward to the Boston Society of Natural History such as he might have it in his power to collect, he might rely on promptly receiving our own species in exchange, and would be instrumental in removing a grievous stumbling block from the path of those in this country, who take an interest in the advancement of this department of Natural History.

PATELLOIDEA AMÆNA.

SYNONYMS. Patélla amæna, Say, *Journ. Acad. Nat. Sc.* II., 223.

Patelloidea amæna, COUTHOUY.

Animal, oblong oval, moderately convex, superiorly, with a thick, muscular, smooth, dilatable, elongated-oval foot, with a faint dividing line running through its middle. Mantle tolerably thick, contractile, surrounded by numerous short, fibrous processes, as with a fringe, which project beyond the shell when the animal is in motion, and are endowed with great sensibility; on the back the mantle is of a deep green color, and exceedingly thin and delicate, the viscera shewing plainly through; it adheres by a strong muscle in its whole extent, save at the anterior portion, where that part covering the head and neck floats free. The head is elongated, rounded and terminated by a proboscidiform mouth, whose internal edges are furnished with numerous fine papillæ, and the jaws with a thin, sub-triangular, corneous plate, situated perpendicularly on each side of the mouth, between which is a narrow, flat, lingual organ, arising from the back of the head, and after numerous windings among the superior viscera, terminating in the inferior and posterior portion of the liver. The tentacula, two in number, are long, slender, pointed and contractile, inserted about midway on each side of the head, and having the eyes black, small but conspicuous, situate externally on a slight protuberance at their base. The branchial organ arises from the middle of the back of the neck, at the bottom of a cavity or open sac, formed by that part of the mantle covering the anterior portion of the animal; the branchiæ, formed by numerous subtriangular lamellæ, placed one above the other on each side of a long, respiratory cordon, and diminishing in size toward its termination, always project during life on the right side of the head, on which side, near their origin, are situated the genitalia, the anus opening on the same side a little lower down; the ovaries are voluminous, disposed around the sides of the back, and terminate in a long canal or tube, which, crossing the back of the neck from the left side, opens into the branchial sac, on the right side, at the base of the branchiæ. The liver is of a brownish color, and occupies nearly the whole of the central portion of the back. The position of the heart was not ascertained.

Shell, as described by Mr. Say. Jour. Acad. Nat. Sciences, vol. II. 223.

OBSERVATIONS. After the numerous genera, which, up to 1825, had been dismembered from the Linnean Patellæ, they were supposed to remain so clearly defined, that no farther reduction was likely to occur. And after Mr. Sowerby had instituted his genus Siphonària, now fully admitted by all Zoölogists, they appeared to be so thoroughly sifted, so uniform, and if the term may be used, homogeneous in their structure and appearance, that any farther dismemberment seemed absolutely impracticable. Messrs. Quoy and Gaimard, the able naturalists who accompanied the Astrolâbe in her scientific voyage, prosecuted under the auspices of the French government, have proved the contrary, by ascertaining that a number of Patelliform shells, the only external peculiarity of which, was that of being more symmetrical than the generality of Patellæ, protected animals which, in all other respects closely resembling those of that genus, differed from them in the important character of having the respiratory organs composed of a single branchia on the right side, formed by numerous pyramidal lamellæ arranged above each other on each side of a respiratory cordon, like the teeth of a comb, as in the Umbrella, instead of being, as in the Patella proper, disposed around the body, between the foot and the mantle. To a genus thus singularly uniting an animal of the Monopleurobranchiata, Blainville, with a shell like that of a Patella, (now belonging to his Inferobranchiata) they gave the appellation of PATELLOIDEA. This name, though objectionable from its having been previously adopted by M. de Blainville for the third family of his Monopleurobranchiata, comprising the Umbrella and Siphonaria, has been retained by M. Deshayes in his recent edition of Lamarck, in preference to Mr. Sowerby's name, Lóttia, as being the first published. Mr. Sowerby's characters were, moreover, incomplete, from being founded on the shell alone. He was struck with the great symmetry existing among certain species of Patella, and proposed to assemble them under the generic title of Lóttia. Quoy and Gaimard however, assure us, that it is impossible to distinguish the genera by the shell alone.

The Patelloidea which have been hitherto found are, for the most part, small, fragile and sub-diaphanous. The naturalists just mentioned describe about a dozen species, chiefly from the coasts of New Holland and New Zealand ; and I apprehend that PATELLA *cærùlea* and P. *pellùcida*, Linn., inhabiting the shores of Europe will, on examination, be found to pertain to this genus.

One of the changes in classification consequent upon this discovery must be, the suppression of M. de Blainville's family Retifera, the first in his order Cervicobranchiata, and instituted solely for the reception of the Patellæ. He was led to this by the supposition, that a retiform appearance at the bottom of the branchial cavity was the true organ of respiration; and that naturalists had erroneously considered the foliated cordon surrounding the body, between the foot and the mantle, to be so. Besides this retiform appearance, however, having been subsequently observed upon several mollusca, whose respiratory organs are well established, the opinion of M. de Blainville is disproved almost beyond debate, by the fact that in the Patelloideæ, the apparatus existing between the foot and the mantle of the Patellæ is suppressed, and its place supplied by an undoubted respiratory organ, very differently situated, while in other respects their organization is almost precisely similar.

I have long entertained doubts whether the shell found on our coast, and commonly known as PATELLA *amœna*, Say, did not in truth belong to the Patelloideæ, and have lately ascertained, from an examination of the animal, that such was the case. The position of some of the principal organs was found to differ considerably from that assigned to them by Quoy and Gaimard, if M. Deshayes is correct in his statement that their animal was precisely like that of Patella, except in the situation of the branchiæ. I have not access to their own descriptions. The anus in the Patella is situated on the neck, just back of the head, and the ovarial duct terminates near the right tentacula, according to those authors; whereas, in our Patelloidea, these organs are placed at the bottom of the cervical sac, near the base of the branchiæ. I have nowhere seen any mention of the corneous plate with which the mouth of our species is furnished, but have no doubt, from having found it in another, that it is constantly found, both in this genus and the Patella; and that it should be adopted as one of their generic characters.

The "lingual ribbon," as it is termed by the French naturalists, resembles a narrow, flat chain, and has a metallic lustre something like bronze. Its length, when separated from the viscera, was nearly an inch, in an animal three-fourths of an inch long. When thus detached, its appearance is that of a minute, compressed trachea, the segments of which it is composed, resembling the cartilaginous rings of that organ. During life the animal keeps this appendage constantly in motion, upward and downward, at very regular intervals, in such a manner as to describe each time the arc of a circle. Its purpose is doubtless for the trituration of food.

I am enabled to state that the Patelloideæ are oviparous, having repeatedly witnessed the extrusion of the ova, which are numerous, unconnected, very minute, nearly round, semi-transparent, and of a green color. Examined under a powerful microscope, a small, dark point was visible in the centre of each; but no regular form, nor appearance of a shell could be discerned. As many as a couple of hundred were placed in a small box, having the ends covered only with fine gauze, and exposed in a situation where the tide flowed freely over them, for the purpose of ascertaining, if possible, the period requisite to bring them to maturity. At the expiration of a week, a very slight increase of size was perceptible, but still no distinct shape could be made out; and on my next visit to the spot, the box had been removed. As this point is yet in obscurity, both as regards this genus and the Patella, it is to be hoped that some one in our Society will take up the subject, and give it a full investigation.

PATELLOIDEA ALVEUS.

SYNONYMS. Patélla álveus, CONRAD, *Jour. Acad. Nat. Sciences*, VI., 267, *tab.* 2, *f.* 20.
Patelloidea álveus, COUTHOUY.

OBSERVATIONS. There is hardly any perceptible difference between the animal of this species and the preceding, except that in consequence of the lateral compression of the shell, its body is rather more oblong, and the back a little more convex. The tentacula also, appear to be somewhat longer and more slender than in P. *amæna*. The position of the eyes is the same in both, as is that of the genital and anal orifices and branchiæ, the latter seeming merely a trifle broader. Perhaps it would be more correct to consider it as a constant variety of P. *amæna*, than as a distinct species. It is, however, very marked and unvarying in its external characters; and many species have been received as valid, upon far narrower distinctions than exist between this and Mr. Say's shell. It may be added, that I have never found P. *álveus* except upon marine plants; whereas P. *amæna* is for the most part met with upon rocks exposed to the sea.

NUCULA NAVICULARIS.

Plate IV. fig. 4.

A. testâ parvâ, lævi, fragili, ovali, subæquilaterali, luteo-virescente, anticè rotundatâ, posticè truncatulâ, cardine dentibus octodecim, intùs albo-nitescente.

DESCRIPTION. Shell small, oval, thin and brittle, rather compressed, sub-equilateral, slightly gaping at both ends, smooth and polished, with occasional eroded patches toward the summits ; color a pale greenish yellow ; striæ of growth concentric, regular and very indistinct ; the anterior extremity is elliptically rounded, the basal margin curved strongly outwards, the posterior extremity is somewhat narrowed and compressed, feebly rostrated and very slightly truncated ; the beaks are quite prominent, inclined a little backwards, and contiguous at their summits ; hinge furnished with sixteen or eighteen aculeated teeth, divided in the middle by a spoon-shaped fossa projecting obliquely forward, the anterior side having usually two or three more teeth than the other. The interior is white and polished ; muscular impressions remote, nearly imperceptible, the anterior oblong, narrow, the posterior round and very small.

Length eleven-twentieths, height five-twentieths, and diameter three-twentieths of an inch.

Inhabits Massachusetts Bay, vicinity of Plymouth.

OBSERVATIONS. Somewhat resembles N. *rostràta*, Mont., but is destitute of the sulciform striæ so remarkable in that shell, and is less prominently rostrated. It is distinct from N. *myàlis*, Nobis, by the different position of the beaks, and the more strongly curved outline of the basal margin. From Arca (Nucula) *minùta* of British authors, it is distinguished by the absence of impressed striæ. In its general outline it is shaped not unlike a boat, or perhaps a half-moon. Only a single valve was found of the size here indicated; but half a dozen perfect specimens have been obtained, measuring from five to seven-twentieths of an inch in length. I am indebted for them to the kindness of William W. Wheildon, Esq. of Charlestown, by whom they were taken from the stomach of cod, caught off Plymouth in the month of July.

BULLA LINEOLATA.

Plate III. fig. 15.

B. testâ parvulâ, oblongo-ovatâ, ferrugineâ, transversim obliquè frequenterque striatâ, spirâ prominulâ, aperturâ magnâ, ad basim valdè dilatatâ et sub-effusâ.

Description. Shell small, oblong-ovate, broadest at the base, color a pale brown, covered with a thin, ferruginous epidermis, and marked with numerous impressed, oblique, transverse striæ, composed of three volutions, the last enveloping all the rest; spire slightly prominent, lip arising from near its summit; aperture extending the whole length of the shell, narrow superiorly, and very much dilated towards the lower extremity; somewhat effuse at the base; near the middle of the columella is a very faint oblique fold. Internal color a glossy yellowish white.

Length six-fortieths, breadth three-fortieths of an inch.

Inhabits the waters of Massachusetts Bay.

In the collection of the Bost. Soc. of Nat. History.

Observations. This little shell was taken from the stomach of a haddock, caught in October last, in about twenty-five fathoms water, off Race Point. At the first glance, it looks much like a diminutive specimen of B. *lignària*, Linn., both in its outline and by its numerous oblique striæ. It is, however, very distinct from that species in any stage of growth, in having an obtusely prominent spire, instead of discoidal or sub-umbilicate. A single specimen only has been met with, which, though only of the size here given, has every appearance of an adult shell.

BULLA HIEMALIS.

Plate IV. fig. 5.

B. testâ perparvâ, hyalinâ, globosâ, convolutâ, longitudinaliter tenuè striatâ, spirâ nullâ, aperturâ ad basim valdè dilatatâ.

Description. Shell globular, minute, very thin and brittle, hyaline, with a brownish tinge, except near the lip where it is whitish; body whorl enveloping all the rest so as to leave no perceptible spire, and covered with very delicate incremental striæ; the aperture is narrow for a short distance from its upper extremity, but is greatly dilated toward the base; the outer lip is very strongly and regularly curved; the columella slightly arcuated and reflected upon the body of the shell, so as to form a very small but distinct umbilicus.

Length one-tenth of an inch, breadth about the same.

Inhabits the waters of Massachusetts Bay.

My own collection and that of the Boston Society of Natural History.

OBSERVATIONS. Half a dozen specimens of this curious little shell were procured from codfish, taken last January off Provincetown, in about thirty fathoms water. It is very distinct from any species I have ever seen described, in the singular formation of the body whorl, the summit of which shews no trace of any spire, the lip arising from it much the same as it does in the young of Cypræa. The aperture is exceedingly dilated toward the base, by the arcuation of the columella, and the very strong outward curvature of the lip; the base is very slightly effuse. The brownish tinge on the inferior portion of the body, seems to be owing to a very slight deposit of extraneous matter.

BULLA GOULDII.

Plate IV. fig. 6.

B. testâ parvâ, ovatâ, convolutâ, fragili, albâ, transversim tenuè striatâ, spirâ depressâ, imperforatâ, interdum prominulâ, anfractibus quatuor, supernè rotundatis, suturis impressis, aperturâ suprâ angustâ, versus basim dilatatâ, columellâ arcuatâ.

DESCRIPTION. Shell small, ovate, thin, brittle, shining, white, rather opaque, convolute, composed of four volutions, rounded at their upper edges, and having the sutures strongly defined, the last whorl nearly enveloping all the others, and covered with numerous, fine, impressed, transverse striæ; spire depressed, discoidal, sometimes slightly mammillated, incremental striæ hardly discernible; the lower extremity of the shell rather narrower than the upper. The aperture is narrow superiorly, and abruptly dilated toward the base by the arcuation of the columella, which is white, glossy, and without any umbilicus behind it. A thin, olive-colored, membranous epidermis, very easily detached, covers the exterior surface. The interior is white and polished.

Length eleven-fortieths, diameter five-fortieths of an inch, nearly.

Inhabits Massachusetts Bay.

My own collection and the Cabinet of Bost. Soc. of Natural History.

OBSERVATIONS. This shell very closely resembles B. *insculpta*, Totten, but has the spire imperforate, which is not the case with that species. Its aspect is also something like that of BULLINA *canaliculàta*, Say, but it is much more inflated than that shell, and is without the oblique fold on the central portion of the columella. B. *canaliculàta* is almost cylindrical, rather broader at its base than summit; B. *Gouldii* is very regularly ovate, and narrower at the base.

In some individuals there is a tinge of purple at the superior termination of the body whorl, where there is usually a short indenture or sinus between the body and the right lip. The transverse striæ are hardly perceptible to the naked eye, and are occasionally interrupted by small, eroded spots. The spire is sometimes flattened, and presents a truncated appearance; and often the outer volution forms an elevated, rounded ridge, encircling and rising above the others. Altogether, it is a very distinct and strongly marked species. Four specimens were obtained from the stomach of cod and haddock, taken during the early part of May in about twelve fathoms water, off Cohasset rocks; and a specimen was picked up in July at the eastern end of Nahant Beach. I have named this shell after our associate, Dr. A. A. Gould, as a slight tribute of acknowledgment of my repeated obligations to him, for his assistance and coöperation in determining the identity of such species as I have supposed to be new, and the beautiful and accurate manner in which most of them have been delineated by him.

PLEUROTOMA DECUSSATA.

Plate IV. fig. 8.

Pl. testâ parvulâ, ovali, fusiformi, albidâ, anfractibus quinque convexis, longitudinaliter plicatis, transversè striis frequentibus tenuibus decussatis, aperturâ elongato-ovali, basi sub-canaliculatâ, labro tenui, lævi, supernè indentato, columellâ nitidâ, depressâ, arcuatâ, ad basim sinistrorsum divergens. Operculum rudis.

DESCRIPTION. Shell small, oval, fusiform, white, covered with a thin, light-olivaceous adherent epidermis; composed of five or six convex volutions, having the sutures strongly marked, plicate longitudinally and obliquely and decussated by numerous delicate, revolving striæ; the body whorl is rather ventricose, and constitutes a little more than half the entire length of the shell; the revolving striæ are more distinctly marked on this part than any other, but the longitudinal plaits disappear about half way between the suture and the base; the other whorls are plicate in their whole extent; the spire is obtusely conical; aperture elongated oval, slightly channeled at the base; lip thin, sharp, smooth internally, with a sub-angular sinus or indenture at its junction with the lower whorl; columella white and polished, arcuated, somewhat flattened, and its base turned rather abruptly to the left; no umbilicus, operculum unguiculate, spire sub-terminal, striæ of its growth coarse.

Length seven-twentieths, diameter of lower whorl three-twentieths of an inch.

Inhabits Massachusetts Bay.

My own collection and that of the Boston Society of Nat. History.

OBSERVATIONS. A very distinct species, and not liable to be confounded with any shell found on our shores, unless it be FUSUS *harpulàrius*, Nobis, pl. 1, fig. 10. It may, however, be easily distinguished from that shell by the greater convexity of its whorls, the absence of any flattening at the sutures, and the angular sinus at the junction of the lip; as well as by its being white, instead of brown. In old shells the sutures are almost canaliculate, and the superior whorls considerably eroded. Three specimens were procured from haddock, caught in March last, in about fifteen fathoms water, off Barnstable, Cape Cod.

Genus ANCULOTUS, Say.

DESCRIPTION. Shell sub-oval, rarely conical; spire generally depressed; aperture sub-orbicular or obovate, rounded at base; base of the columella rounded or obtusely angulated; columella wide, thickened, polished, generally with a callus near its superior junction with the labrum.

ANCULOTUS DENTATUS.

Plate IV. fig. 7.

A. testâ rotundatâ, vel sub-conicâ, irregulari, olivaceo-nigrescente; anfractibus quinque, ultimo magno, ventricoso, sæpè fasciis duobus aut tribus badiis cincto; suturis impressis, spirâ obtusâ plerumque erosâ; aperturâ erosâ, basi effusâ; columellâ atrâ, arcuatâ, depressâ, ad basim unidentatâ, posticé excavatâ, intus virido vel fusco-albescente. Operculo corneo, unguiculato.

DESCRIPTION. *Animal*, much like that of Melania; foot broad, short, rounded and thick, body and head black, the latter sub-orbicular, terminating in a short, proboscidiform mouth, and furnished with two short, rather stout and pointed tentacula, black posteriorly and with faint greyish, transverse bands on their anterior side; eyes minute, situate on a slight enlargement of the tentacula near their external base. Operculum elongated, unguiform, thick, corneous, blackish or brown, opaque, spire terminal, increment coarse and apparent.

Shell, rounded or obtusely conical, sub-diaphanous, very irregular in its conformation, frequently gibbous and distorted; the color varies from light olive-green to black, according to the age of the specimens; whorls five or six in number, the last constituting the greater portion of the shell, very much inflated or ventricose, and sometimes ornamented with two or three dark brown, transverse bands; spire obtuse, always considerably eroded, unless in very young shells; incremental striæ oblique, in some individuals barely apparent, and in others forming strong ridges on the last whorl; aperture rounded, effuse at the base, right lip thin, sharp and broadly everted; columella dark brown or purple, flattened, strongly arcuated, with a dentiform projection near the base, which forms a sub-angular sinus or indentation below it. Adjoining the columella is a strongly marked lacuna or fossa, most conspicuous in very old shells, but apparent in every stage of growth, and extending from the base of the shell to the centre of the lower whorl. There is no umbilicus, properly speaking, that region being consolidated by the columella. The internal color is chiefly greenish or brownish, with occasional shades of a yellowish white, in old shells.

Height ten-fortieths, diameter of last whorl eleven-fortieths of an inch.

Inhabits the rapids of the River Potomac, Va.

My own collection, that of the Bost. Soc. Nat. Hist., A. A. Gould, M. D., and several others in Boston.

Observations. This shell, at first sight, might be mistaken for Anculotus *monodontoides*, Conrad, from Alabama, but may be distinguished from it by the peculiar flattening of the columella, which is deep purple or brown instead of white, and the remarkable fossa in the umbilical region. In that species, moreover, the tooth is situated on the middle of the columella, and resembles a plait or fold at that part; whereas in ours, it is formed by an oblique, inward projection of the columella near the base. The external conformation is exceedingly irregular, varying from sub-conical to globose, sometimes compressed on the back, at others strongly gibbous. The aperture is also frequently distorted. Young specimens are of a light, olive-green color, while older ones are nearly black, and usually covered with an earthy coating. The lower whorl is invariably marked at its base with a broad, dark-brown band, and has frequently one on the middle and one on the superior portion.

Some of the varieties of this shell, when undistorted, have so great an external resemblance to some of the varieties of TURBO *palliàtus*, Say, that a figure of one might answer very well for both.

It was found in abundance on the rocks, at the rapids, about a mile above the little falls of the River Potomac, apparently delighting in situations where one would imagine it difficult for it to adhere. The only shells found in company with it were MELANIA *Virgínica*, Say, and ANCULOTUS *nigrèscens*, Conrad, which latter was in great abundance and variety of form. Some of its less angular varieties closely approached A. *dentàtus*, in their general appearance, but were easily distinguished by the form of the aperture and the absence of the columellar lacuna.

EOLIS DIVERSA.

Plate IV. fig. [illegible]. 14.

E. corpore limaciforme, posticè acuto, diaphano, luteo-rufescente, capite distincto, sub-orbiculato, depresso; tentaculis gracilibus elongatis duabus instructo, duobusque brevioribus ad partem posticum capitis positis; branchiæ aurantiacæ seriebus binis lateribus dorsi dispositis. Orificia generationis magna, juxta collum ad latus dextrum, ano paulum pone, pede suprà laciniato.

DESCRIPTION. Body limaciform, very much elongated, tapering to a fine point and very contractile, semi-transparent, of a very pale yellow, to which a tinge of red is imparted by the viscera showing through; head very distinct, sub-orbicular, depressed, furnished with two long, slender, lateral tentacula, arising from near its junction, and two short, rounded, smooth ones, situated on the back of the head, a short space in the rear of the first pair; between them, just behind this shorter pair, are the eyes, black and so minute as to be nearly imperceptible without a lens; the mouth is vertical, formed by two fleshy, contractile lips, covering a thin, corneous jaw adapted for cutting; between these lips, a narrow, black, lingual ribbon is constantly in motion. The foot is but little wider than the body, and extends its whole length, being divided on each side at its commencement, so as to form two dilatable, tentaculiform processes. The branchial cirri, slender, externally transparent, internally of a beautiful orange, slightly retractile and tubular at their extremities, are disposed in double ranges along the sides of the back to the number of about ninety, those placed externally being considerably shorter than the inner ones; between these are irregularly scattered numbers of very short ones. The genital orifice is large, placed just behind the neck on the right side; the excretory duct opens a short distance behind and below it.

Length one and four twentieths, breadth seven twentieths of an inch.

Inhabits Massachusetts Bay, Chelsea Beach.

OBSERVATIONS. This species, which was found last spring among the roots of LAMINARIA *saccharina*, owing to the similar coloration of the branchial cirri, has much resemblance in its general aspect to E. *salmonàcea*, Mihi, described at p. 68, tab. 1, f. 3, 4. It will be found, however, on closer examination, to differ very materially in the form and position of the tentacula.

In E. *salmonàcea*, the lateral ones arise from and appear like a prolongation of the fleshy lips, instead of being placed near the neck, and the superior ones are long, somewhat compressed, and, as it were, serrated at the edges; while in E. *divèrsa*, they are short, smooth and round. The genitalia also are situated much farther forward in this species. than in any other I have previously examined. See plate 1, f. 1 to 5, of this Journal for other distinctive marks.

ART. VIII.—REMARKS UPON THE NORTH AMERICAN INSECTS BELONGING TO THE GENUS CYCHRUS OF FABRICIUS; WITH DESCRIPTIONS OF SOME NEWLY DETECTED SPECIES.

By Thaddeus William Harris, M. D., Librarian of Harvard University. Read August 15, 1838.

Having, in the course of the past year, undertaken to revise some of the American insects in our collections, I have detected several errors in the generical characters as laid down in the books, and have found it necessary to separate certain species which, heretofore, have been confounded with described insects, and have, furthermore, discovered some mistakes into which I have, myself, fallen and led others, for the want of specimens for comparison.

I am not at all disposed to be captious in my remarks upon the distinguished naturalists, whose works form the standards in entomological science; I do not wish to be forward in obtruding my own discoveries; nor am I at all actuated by the vain-glory of indicating, naming, or describing new species, whether necessary or not;

but I do think it of some importance to point out remarkable errors, to rectify mistakes, and to establish the nomenclature, synonymy, and diagnosis of our insects upon the basis of a careful scrutiny and comparison, and a consultation of the original authorities of the first descriptions. And indeed I should feel myself wanting in my duty to you and to science, were I any longer to hesitate to bring forward and record, in a permanent form, the result of my observations.

With these motives in view, I have already presented to the Academy of Natural Sciences of Philadelphia a paper containing remarks upon some of the genera of our beetles, together with descriptions of some of the insects brought by Mr. Townsend from Oregon, belonging to the collection of the Academy. And I now propose to follow up the general subject, by offering to you, for our journal, a few descriptions of insects inhabiting our country, together with such remarks as may be necessary upon the genera to which they belong. The present paper will be confined to the native beetles belonging to the genus CYCHRUS of Fabricius.

This has been divided by Count Déjean into three genera, whether judiciously or not will appear in the sequel. These three genera, viz. CYCHRUS, proper, SCAPHINOTUS, and SPHÆRODERUS have been adopted in the 2d edition of the "Régne Animal" of the late eminent naturalists Cuvier and Latreille; and indeed the genus SCAPHINOTUS seems first to have been indicated by the latter. The distinguishing character of the genus Cychrus, as laid down by these authors, is, that the tarsi are alike in both sexes. In my paper on the insects of Oregon, I have shown that this character is not correct; for the first three joints of the anterior tarsi in the males of Cychrus *viduus*, *tuberculàtus*, *cristàtus*, and *marginàtus* are dilated, and together with the smaller fourth joint are furnished with brushes beneath. Indeed, in form and structure these parts are scarcely to be distinguished from the anterior tarsi in the males of Scaphinotus. A similar structure is visible in the tarsi of Cychrus *rostràtus*, the only European species of which I have seen a male; but the dilated joints are proportionally smaller than in our American species. The only remaining character by which the genus Cychrus is distinguished from Scaphinotus is the form of the margin and of the posterior angles of the thorax; in Cychrus, it is stated that the lateral margins of the thorax are not raised, and the posterior angles are rounded and not produced behind; while in Scaphinotus the lateral margin is said to be turned up, and the posterior angles are acute and prolonged backwards. Now in Cychrus *viduus*, and still more remarkably in a new species, which remains to be described, the lateral margins of the thorax are wide, and evidently elevated, particularly behind; and the posterior angles extend more or less beyond the basal edge of the thorax, though they are not much produced backwards. On the other hand, in our new species of Scaphinotus, the lateral margins of the thorax are much less raised than in the typical species *elevàtus*, and the posterior angles are wider, not so acute, and not so much prolonged behind. Will these slight and variable differences in the form of the thoracic margins and posterior angles be considered sufficient to establish a genus, in the absence of all other distinguishing characters?

Sphæroderus is rather better entitled to be considered as a legitimate genus, both from the structure of the first pair of tarsi in the males, and from the orbicular or heart-shaped form of the thorax. There are, however, species of Cychrus, which approach more or less closely to this genus in the form of the thorax. In Cychrus the first joint of the anterior tarsus is nearly twice the length of the second, which is also elongated, narrowed at base, and nearly triangular. In Sphæroderus, the first joint is not much longer than the second, and is nearly as wide as it is long; while the second joint is transversely quadrate. This character was first pointed out by Knoch, in his "Neue Beiträge," and is represented on the eighth table of his work, where also are very correctly figured Cychrus *viduus*, Scaphinotus *elevàtus*, and Sphæroderus *stenóstomus*.* While on the subject of the figures of these American species I might observe, that those which have been given of them in Say's Entomology, from drawings by Mr. T. R. Peale, are very inaccurate.

In the collection of this society, there is a specimen of *Cychrus viduus*, which was brought from Florida by Dr. Binney; and I have compared it with another specimen, also from Florida, in the collection of the Academy of Natural Sciences. These insects agree perfectly with the description given by Knoch and Say, under the name of *unicolor*, and with that more recently drawn up by Dejean under the name of *viduus*. On comparing these specimens with our northern species, I have been compelled to separate the latter, and have given it the name of CYCHRUS *Leonárdii*, with the following characters.

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* Count Déjean has neglected to refer to Knoch's figures and descriptions of the two latter insects, for what reason it does not appear.

CYCHRUS LEONARDII.

Black; head transversely striated; thorax violaceous, sub-quadrate, narrowed behind; elytra broad ovate, carinated at the sides, bronzed violet, deeply crenato-striated.

Length, including the mandibles, from eleven to thirteen lines.

Head black, front tinged with violet, with transverse striæ or minute wrinkles between the eyes. *Thorax* violet colored, sub-quadrate, rounded at the sides before, and narrowed a little behind; the lateral margins are broad and obliquely elevated, especially towards the base; the middle is smooth, with a longitudinal impressed line; the sides and base are punctured, and the latter has a deep transverse depression before the hind margin. The *elytra* are violaceous and bronzed; they are of a broad ovate and almost cordate form, particularly in the females, moderately convex, and with a sharp, elevated, lateral carina; the striæ are distinct, and crenulated or punctured on their sides, but become obsolete towards the tip, which is rough, with irregular dilated punctures. *Epipleuræ* bronzed violet, rugosely punctured. *Body* beneath and *legs* black.

Inhabits the northern and western parts of Massachusetts and New Hampshire.

Hitherto I have mistaken this very fine species for the *viduus*, and it is entered under this name in the

"Catalogue of the Insects of Massachusetts," appended to Prof. Hitchcock's "Report on the Zoölogy," &c. of the State. From the *viduus* it differs not only in color, but in being of a more dilated form. The thorax is of a deep violet color above, it is wider behind, not angulated at the sides, approaching more nearly to the form of a square, the lateral margin is wider, and the posterior angles are larger and not quite so obtusely rounded. The elytra are rather broader, rather more heart-shaped, very evidently æneous, and both the striæ and the punctures, which form their crenated indentations, are more distinct. In the *viduus* the thorax is blue black or greenish black, somewhat angulated at the sides, or, as Knoch very correctly says, "hexagonal."* The elytra are of a longer ovate form, are destitute of the brassy lustre, or are only faintly tinged with copper color; and Knoch, who gives to this species the name of *unicolor*, says it varies in being entirely black.

I am indebted to the Rev. Levi Washburn Leonard for a specimen of the species which I have dedicated to him; and Dr. Gould has received from New Hampshire and Vermont several specimens, four of which I have examined in drawing up this description. The true *viduus* has not, as yet, been found in this vicinity. In the form of the thorax, the *viduus* and this new species recede from all the others of the genus which I have seen, and approach more nearly to the genus Scaphinotus, in this respect.

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* Neue Beyträge zur Insectenkunde, p. 187.

CYCHRUS ANDREWSII.

Black; thorax deep greenish blue, heart-shaped, narrowed behind, and slightly margined at the sides; elytra deep blue, faintly tinged with violet, slightly carinated at the base and sides, and with punctured striæ.

Length, including the mandibles, nine and a half lines.

Head, blue-black, smooth, obsoletely wrinkled on the front, and impunctured. *Thorax*, heart-shaped, very much narrowed and truncated behind, rounded at the sides, with a small elevated lateral edge, furrowed in the middle, and slightly depressed before the base, which is covered with shallow, irregular punctures. *Elytra* oblong-ovate, quite convex, and very slightly carinated at the shoulders and sides; they are marked with fine and narrow punctured striæ; but the striæ become obsolete and the punctures irregular and more dilated, at tip. *Epipleuræ* greenish black and punctured. *Body* beneath black. *Legs* black; *tarsi* rust-colored.

Inhabits North Carolina.

This species has very much the form of the *marginàtus* from Ounalaschka and Oregon, and it still more closely resembles, in its proportions, a new species from Oregon, which I have described under the name of *cristàtus* for the Journal of the Academy of Natural Sciences of Philadelphia. It is a much more convex species than the *marginàtus*; the thorax is narrower behind, with more rounded posterior angles; the elytra are distinctly striated and punctured, the interstitial lines are entire and not broken into tubercles, and the carinated edge is much narrower and not at all more conspicuous at the humeral angles than at the sides.

Prof. Hentz, in his manuscript catalogue, dedicated this species to its discoverer, the son (now deceased) of Prof. Andrews, late of the University of North Carolina; and I have thought proper to retain his name. The specimen is a female, and now belongs to our collection.

SCAPHINOTUS HEROS.

Black, short, ovate, and thick; thorax violet-black, narrowed behind, and with the lateral margin moderately reflected; elytra violaceous, with punctured striæ, the humeral angles rounded, and not much more elevated than the lateral margin.

Length, including the mandibles, eleven and a half lines.

Head black, violaceous on the front, impunctured. *Thorax* black, more or less distinctly tinged with violet, punctured at the sides, apex and base; rounded at the sides, narrowed before and behind, with the posterior angles subacute, and produced backwards; the lateral margins obliquely elevated behind, with a thick and very obtuse edge, particularly before the middle: there is a distinct, impressed, central longitudinal line, and the base is very deeply and transversely impressed before the hinder margin. *Elytra* ovate, short, tolerably convex, and almost heart-shaped; they are of a fine, deep violet color, and very slightly bronzed; the humeral angles are rounded and not much elevated; the lateral carina is narrow and slightly reflexed; the striæ are deeply impressed and punctured, and the interstitial lines are convex; the striæ become obsolete at the tip, and the punctures larger, more shallow and irregular. *Epipleuræ* violet, punctured. *Body* beneath, *antennæ* and *legs* black; *tarsi* piceous.

Inhabits Ohio and Indiana.

This noble species is readily distinguished from the *elevàtus* by its superior magnitude, by its shorter, thicker, and more convex form, and by its differently shaped thorax, which is more narrow before, and much more contracted behind; the lateral margins are oblique and not so much elevated, and the edge is much thicker and more rounded; the posterior angles are not so much produced behind, and are not so acute; the disk is not so much depressed, while the posterior transverse indentation is very much deeper. The elytra are bronzed, but are destitute of the bright cupreous tinge of the *elevàtus*; the striæ are deeper and more distinct; the interstitial lines are wider, more elevated, more convex, and perfectly smooth; and, lastly, the lateral carina is more narrow, and not so much elevated, particularly at the humeral angles, which are also more obtusely rounded.

Knoch has described and figured the *elevàtus* as having the thorax equally broad, "æqualiter latus;"—and indeed it is nearly as wide at the base as in the middle, in which respect it differs essentially from the *heros*. The carina at the shoulders of the elytra, in the *elevàtus*, is remarkably wide and elevated, which gives a great prominence to the humeral angles. Fabricius, the first describer of the *elevàtus* and of another species, which he calls Cychrus *unicolor*, says, of the latter, that it is of the same form as the *elevàtus*, is larger, but closely allied, and that perhaps it is a mere variety of it.[*] From the figure which Olivier[†] has given of the *unicolor*, I am inclined to think that Fabricius was correct. We have specimens of the *elevàtus*, which are entirely black, and which approach very nearly to the size and form of Dr. Hunter's specimen of the *unicolor*, from which Fabricius took his description, and Olivier his figure.

SPHÆRODERUS LECÓNTEI, Déjean.

This species is not uncommon in Massachusetts, and hitherto I have mistaken it for the *stenóstomus*, and have so called it in my "Catalogue," appended to Prof. Hitchcock's Report. The true *stenóstomus* has not yet been found in Massachusetts. The specimen sent to Mr. Say from Salem by Dr. Pickering, and which, in a broken state, still remains in Mr. Say's cabinet, is the *Lecóntei* of Déjean. SPHÆRODERUS *Lecóntei* is usually of a larger size than the *stenóstomus*, and is also rather more convex; but it is to be distinguished from the latter chiefly by the greater roughness of the hinder part of the elytra, the interstitial lines, from the middle to the tip, being transversely interrupted or broken into elongated tubercles, while in the *stenóstomus* this interruption of the lines does not appear till near the tip, and is far less obvious even there, than in the *Lecóntei*. In the form of the thorax and elytra these two species are hardly to be distinguished from each other.

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[*] Mantissa. Tom. I. p. 198.

[†] Entomologie, III. No. 35, pl. 6, f. 62.

SPHÆRODERUS BILOBUS, Say.

Of this species I have seen only one specimen, the original from which Mr. Say drew up his description, and which was brought by Mr. Nuttall from Missouri. The thorax very closely approaches, in form, to that of *Cychrus marginàtus*, but it is as deeply furrowed in the middle as that of *Cychrus angulàtus*, which circumstance give to it the bi-lobed appearance that suggested its name.

NOTE. At the time the preceding article was read to the Boston Society of Natural History, the writer exhibited, to the members then present, specimens of the following North American insects described and mentioned in it; 1. *Cychrus tuberculàtus*, 2. *C. angulàtus*, and 3. *C. cristàtus*, Harris, three new species described for the Journal of the Academy of Natural Sciences of Philadelphia, and 4. *C. marginàtus*, Eschscholtz, all from Oregon ; 5. *C. viduus*, Déjean ; 6. *C. Leonàrdii*, 7. *C. Andrewsii*, and 8. *Scaphinòtus heros*, the new species described in the present paper ; 9. *Scaphinòtus elevàtus*, F., 10. *Sphæròderus Lecòntei*, Déjean, 11. *S. stenòstomus*, Weber, and 12. *S. bilobus*, Say. Detailed descriptions of the new species from Oregon have been in the hands of the publishing committee of the Philadelphia Journal more than nine months, and without doubt are before this time published. It may not, however, be amiss to annex to the present article the specific characters of these three *Cychri*, with a few brief remarks upon them.

C. TUBERCULATUS.

Black opaque; head rugose and with two longitudinal impressions on the front; thorax rugose, truncato-cordate, contracted behind; coleoptra ovate, very convex, granulated, with a triple series of smooth tubercles on each elytron; epipleura rugosely punctured.

Length seven to eight and a half lines.

The anterior tarsi of the male are very slightly dilated, and more thickly covered with short bristles beneath than those of the female.

C. ANGULATUS.

Black; head carinated; thorax angulated at the sides, much contracted behind; elytra violaceous-brown, somewhat flattened, crenulato-striate; legs brownish piceous.

Length six and a half lines.

The specimen, a female, is not perfectly mature. It is probable that, in good and older specimens, the elytra the body beneath, and the legs may be somewhat darker. The peculiar form of the thorax together with the carinated frontal line seem essentially to distinguish this species, which comes nearest to the description of *C. angusticóllis* (Fischer), Déj., a larger insect, with smooth front and a differently formed thorax.

C. CRISTATUS.

Black; head carinated; thorax cordate, contracted behind; elytra crenato-striate, with a narrow, blue margin.

Length five and a quarter lines.

The anterior tarsi of the male are slightly dilated and furnished with brushes beneath, as in the *marginàtus*, which, in other respects, it closely resembles ; but it is a broader and more convex insect, the elevated margins of the elytra are narrower, the interstitial lines are not broken into elongated tubercles, and the head is not plane, but has a rough, elevated, central carina, and an acute, elevated line on each side, above the eyes.

The specimens of *C. marginatus*, Eschscholtz, collected by Mr. Townsend in Oregon, agree, in most respects, with the description given by Count Dejéan ; but the elytra are dark cupreous, instead of *cupreo-æneus*, or (excepting the golden-green margin) exactly of the same color as those of *Sphæroderus Lecóntei.* They vary in size from five to six and a half lines. The anterior tarsi of the males have three dilated joints, which, together with the fourth joint, are furnished with brushes beneath.

These species, though differing a good deal from each other, are more nearly related in form to *Sphæróderus* than to our species of *Cychrus ;* in which respect, also, they approach nearly to some of the European *Cychri.*

Very recently, the "Annales de la Société Entomologique de France" and the "London Entomological Magazine" have come into my hands. In the former of these works,* M. de Laporte, (now Comte de Castelneau) has described a North American insect, which he names *Sphæróderus Niagarénsis*, with the following specific character ; *niger, thorace rotundato, nitide violaceo, elytris ovatis, convexis, cupreo-violaceis, costis longitu-*

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* Vol. I. p. 390—391 (1832.)

dinalibus numerosissimis, marginibus violaceis. Length six and a half, breadth two and a half lines.—He says of the thorax that it is "presque rond, d'un beau violet, échancré en avant, à bords latéraux très-arrondis et fortement rebordés. Il offre, au milieu, une impression longitudinale assez forte, qui n'atteint pas les bords, et deux autres situées en arrière larges et fortement ponctuées;" and, in comparing it with the *Sphæróderus Lecontei*, he says that the thorax is "plus ronde et plus large." If the Comte de Castelneau had not stated that this species ought to be placed between *S. Lecontei* and *stenóstomus*, we might, from the form of the thorax, be led to suspect that it was more nearly related to *Cychrus* or *Scaphinotus;* and, indeed, it seems to bring *Sphæróderus* more closely than ever into connection with these genera. As this species is of large size, and was found on the island just above the falls of Niagara, it is to be hoped that it will not long escape the researches of our own naturalists who may be visiting that celebrated spot.

Mr. Newman has proposed a new genus for what he considers as the *Cychrus viduus* of Déjean, but which I am assured by its captor, Mr. E. Doubleday, is no other than my *C. Leonárdii.* This genus he names IRICHROA,* with the following characters and remarks.

Instrumenta cibaria fere Cychri, sed non eadem: mandibulæ intus dentibus duobus minutis distantibus instructæ; prothorax ferè cordatus, posticè restrictus, truncatus, lateribus carinâ marginali elevatâ instructis; elytra prothorace duplò latiora, convexa, lateribus rotundatis, ca-

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* See Entomological Magazine, Vol. IV. (No. 24, April, 1838,) p. 385.

rinâ marginali elevatâ recurvâ instructis. "This beautiful insect possesses a form and character perfectly distinct from the species of *Cychrus* which inhabit the Old World, as much so, in fact, as *Scaphinotus*, and far more so than *Sphærôderus* of Déjean." In this last opinion, as in many of Mr. Newman's opinions, I am happy most fully to coincide. But, if this gentleman had seen and compared together all the known species of *Cychrus*, *Sphæroderus*, and *Scaphinotus*, I think that he would have suppressed his new genus, or would have still further subdivided the genera already established at the expense of the Fabrician genus *Cychrus*. When a genus becomes unwieldy from the number of species included in it, we are fully justified in subdividing it; and, moreover, when a species presents peculiarities of structure indicating, and accompanied by, a departure from the ordinary habits of the species with which it has been associated, it ought to be withdrawn from them, and should be made the type of another genus. Count Déjean enumerates only eleven species of *Cychrus*, three of *Sphærôderus*, and one of *Scaphinotus*, in the third edition of his Catalogue, or fifteen species altogether; and probably the whole number of known species belonging to these three genera will not, at the present time, greatly exceed twenty. As far as they have been observed and recorded, the habits of all these species are precisely the same; and in their forms we can trace a gradual approach to a common character. After mature consideration and a thorough reëxamination of the various species in my own collection and in my care, although the opinion may be premature before more is known respecting the *larvæ* of these insects, I have come to the conclusion that the insects placed in CYCHRUS, IRICHROA, SCAPHINOTUS, and SPHÆRODERUS *are much more closely related to each other than they are to any other genus,* and that, in fact, they cannot constitute any thing more than *subgenera* in a genus, which, moreover, is not so large as to require subdivision.

ART. IX.—A DESCRIPTION OF THE PRINCIPAL FRUITS OF CUBA. By F. W. P. GREENWOOD.

During a late residence of two months in the city of St. Jago de Cuba, and the district of country surrounding it, I made it one of my amusements to collect and examine the fruits which are produced in that region. Since my return, I have thought that a popular description of them, might be useful as a guide to invalids and others, who contemplate visiting the Antilles, and who may wish to know, as I did, something about the names, qualities, and characters of these fruits, so that they may be able to eat them, as it were, understandingly.

In describing the principal fruits of Cuba, I shall mention those which have been naturalized there, as well as those which are indigenous, without attempting to discriminate the two classes from each other, except in one or two instances. I shall also mention not only those fruits which we seldom or never see at the north, but some others with which we are familiar, in order to introduce some interesting particulars, which may be less known concerning them. But few fruits will enter into my list, beside those which I actually saw, dissected, and tasted; and my descriptions are drawn, not from memory, but, for the most part, from notes which I took with the fresh fruits before me.

Some difficulty I have had in identifying the objects of my examination by their common names. These are different in different islands, and in different parts of the same island; just as among ourselves, dewberries at the south are blackberries at the north. In some cases, the same name is applied to essentially different fruits, which is sadly perplexing. But I have put down all the synonyms which I could gather, and which I thought worthy of a place, and I have no doubt of the general accuracy of my catalogue.

My accounts of the fruits are accompanied by brief memoranda of the trees which bear them, which are usually of remarkable beauty. The botanical names, and a few notices of particular properties, I have taken from writers of authority. It is to be observed, that of almost all the fruits of Cuba, as is likewise the case with our own fruits, there are several varieties.

To please myself, and not without the hope that it might be pleasant to others, I have enlivened my statements with occasional quotations of poetry, the most of which are taken from the "Sugar Cane" of Dr. Grainger, who practised as a physician in St. Christopher's, about the middle of the last century.

My list is arranged in the alphabetical order of the several botanical genera.

ACHRAS SAPOTA. This is a genus, containing at present but one species, of the natural order Sapotaceæ.

The most common name of the fruit is ***Sapotilla***, or ***Sapodilla***; though it is also called by the Spaniards ***Nispero.***

The tree is quite handsome. Its leaves are leathery, glossy, lanceolate, growing in thick tufts. The blossoms are white, bell-shaped, with an agreeable perfume, like that of fresh apple-blossoms.

The fruit is round, about the size and shape of a peach, except that it has no cleft, but is entirely globular. The skin is rough, or downy. The color is nearly the same within and without—an ashen grey; the pulp, however, being brightened with a dash of yellow. This pulp is very soft, when ripe, rather juicy, and somewhat granular, like certain kinds of our pears. Its taste is rich and sweet, but of no very decided flavor—not to be compared, for instance, in the estimation of a northern palate at least, to that of a good peach. In the middle of the pulp are from one or two to five or six flat, black, polished seeds, much larger than those of a watermelon, with a rough, whitish scar occupying the inner edge.

Before it is ripe, the *Sapotilla* is hard and unpalatable, indeed uneatable; and gives out a thick milky juice when wounded. But when fully ripe, it melts away in the mouth; and the milky juice disappears. When broken asunder, the pulp divides itself into several compartments, like those of the orange; but these compartments have no dividing skin which is perceptible.

Externally, this fruit is unpretending and uninviting, looking like a small, round potato, just dug. Its russet balls, however, studding the luxuriant and glossy foliage of the tree, produce a beautiful effect in the mass. I should say that it more nearly resembles, in taste, a sweet and over-ripe pear, than any other northern fruit. It is esteemed by some to be the best fruit which the island produces, though I should place it below two or three others.

In the "Sugar Cane," a lover is represented as seeking the favor of his fair one by offerings of fruit, and of this fruit especially, which is most graciously received, and endowed by the fancy of the maid with an added flavor.

> "The sweetest sappodillas oft he brought;
> From him more sweet ripe sappodillas seemed."

Anacardium occidentale. This is the present botanical name of a fruit which is called by the Spaniards *Marañon*, and by the French *Acajou*, or *Pomme acajou*, from which word, of native origin, comes by corruption the English name *Cashew*. Hence the genus is by some termed Cassubia. The nut itself the Spanish call, as Grainger says, *Anacardo*.

The tree is of a moderate size, thick and bushy, with tufts of oval, glossy leaves, strongly marked by transverse ribs, regularly parallel, and set nearly at right angles with the central rib. The blossoms are small, star-shaped, with five narrow petals of a reddish color, and hang in bunches at the ends of the branches. The blossom is followed by the nut, which acquires nearly its full size, before the fruit is very distinguishable. This nut is kidney-shaped, of an olive color, looking like a large bean. The shell is double, containing an extremely acrid and corrosive oil, "which," says Grainger, "being held to a candle, emits bright, saline sparks, in which the American fortune-tellers pretended they saw spirits, who gave answers to whatever questions were put to them by their ignorant followers." The nut is sweet, but care must be taken that none of this caustic oil is eaten with it.

The fruit, if it may be called so, appears between the nut and the footstalk, and is considered indeed by some botanists, as only the stalk enlarged. When full grown, it is two or three inches in length, and shaped like a pear, or, more exactly, like our green pepper. I have seen some of a bright yellow, others of a deep red, or mahogany color, and others striped with the two colors. Tinted in this gay manner, and having a dark looking nut hanging at its end, it presents a singular as well as pretty appearance. The pulp is of a spongy consistence, tough and fibrous, but charged with a lively juice, powerfully astringent, and of a peculiar flavor. The negroes are said to like it, and it is esteemed healthy. Grainger calls it, in his poem,

> "Thrice wholesome fruit in this relaxing clime."

It may be thrice wholesome, but for my own part, I did not care to taste it twice. Once was enough; for it drew up my mouth, so that I could hardly open it again. Jefferys, in his History of the Antilles, says, "If you attempt to eat this fruit raw, it fetches the skin off the mouth; for which reason, before it is served up at table, it is macerated in wine, or its acrimony corrected with salt." As I was unacquainted with this mystery when in Cuba, I could not test its truth or efficacy. The juice also has the inconvenient property of staining every thing which it drops upon. Considering, therefore, the somewhat troublesome qualities of both nut and pulp, I should conclude that it is a much better fruit to look at than to eat. It is proper to add, however, that the pulp makes a good sweetmeat.

This plant gives its name to the natural order of the *Anacardiaceæ*, which are distinguished by the acrid resin which they secrete, and which is frequently converted by art into a black varnish. The order is placed under the section of the Terebinths, and is made by some to include the sumach, pistacia, mango, and one or two other genera.

ANANASSA SATIVA. This is the now well-known *Ananá* or *Pine apple;* a native of tropical America, but diffused, as soon as discovered, through the tropical regions of Asia and Africa; called by old writers, when it was a great rarity, the King of Fruits, and still wearing its crown.

The enthusiasm and poetic fire with which it was described when new to the civilized world, is quite amusing. "It was thought," says Pomet, "a just appellation, after Father Du Tertre, to call the *Anánas* the King of Fruits, because it is much the finest and best of all that are upon the face of the earth. It is for this reason that the King of Kings has placed a crown upon the head of it, which is as an essential mark of its royalty; and at the fall of the father, it produces a young king, that succeeds in all his admirable qualities." And again, speaking of the crown, he says, "The cluster of leaves, which is the little crown born upon the head, is red as fire." Grainger designates it thus:

> "And the sun's child, the mailed Anana yields
> His regal apple to the ravished taste "

The former scientific name of the pine-apple was *Bromèlia anànas*. It is now a genus under the natural order Bromeliaceæ; while the generic name Bromèlia is appropriated to a class of tropical plants, which are commonly called *wild pines*, and are usually epiphytal in their habit, that is, have the growth of air-plants. The *Ananàssa*, or pine-apple, is distinguished from these and from other genera of the same order, by its succulent fruit collected into a compact head. The crown of the fruit is only the termination of the branch, round which the flowers are clustered. The calyces and bracteæ of these flowers are fleshy, and grow firmly together into a single head; and it is the points of these parts which form the rhomboidal figures, into which the whole surface is divided, and which are called by gardeners the pips. These pips give the fruit the appearance of a pine cone, and suggested the common English name of pine-apple. If you cut them open, you may at any time discern the parts of the flower.

Though the fruit itself is of a splendid appearance, yet the whole plant makes no show, but is, on the contrary, low and ragged; and its long thorny leaves warn you to be careful in your approaches.

There are several varieties of the Ananà. A kind grows wild in Cuba, which is highly scented and flavored, but very acrid, and is seldom eaten, except in some prepared form. The golden yellow, sugar-loaf kind, when fully ripe, is as healthy as it is exquisite. We very seldom get the imported fruit in any thing like perfection; it is either of a poor sort, or gathered unripe. Cuba is the very place in which to find the king of fruits in all his glory. The old writers tried to give an idea of the flavor of a pine-apple to the many who had never tasted one, by saying it was composed of the flavors of the strawberry, peach, rennet apple, and what not beside. It is as well to say at once, that it is indescribable and incomparable.

ANONA. The order *Anonaceæ* comprises several of the most commonly known tropical fruits; as the Sour Sop, Sweet Sop, and Custard Apple. It is distinctly marked "by its flowers having the calyx and sepals arranged in threes, a number of carpella occupying the centre, as in a ranunculus, and by the curious circumstance of their albumen, which here constitutes the bulk of the seed, being what is called ruminated, that is, perforated in all directions by twisting and crossing passages, like the nutmeg." One of the most widely diffused and best known species of this family, is the

ANONA MURICATA; called by the Spaniards *Guanábana*, by the French *Corossol*, by the English *Sour Sop*. The English name is said to be taken from the Indian appellation, *Suirsaak*.

The tree is rather small, especially if compared with the size of the fruit. The foliage is not thick and clustered like that of many tropical fruit trees, but loose and scattered. The uncultivated kind which I met with in the woods, appeared to me to have better foliage though smaller fruit than the cultivated.

The flower is curious, and strongly characteristic of the family. Its calyx is formed by three stiff triangular leaves, like green bark, or the husk of a walnut, an eighth of an inch thick, which enclasp the three petals, of the same form, and nearly as stiff and thick, and of a greenish white. Within these is a ball of numberless short anthers, or carpella. It has a strong odor, like the taste of the fruit, but positively disagreeable. What adds to its singularity is, that it starts out directly from the side of a branch, or from the rough trunk itself.

The fruit is quite large, of an irregular oblong, clumsy shape, bluntly pointed at the extremity. It is of a uniform green color externally, and its tough skin is broken into scales which end in feeble spines. The pulp is white, soft, very juicy, of a peculiarly flavored acid, or sub-acid taste, and is filled with flat black seeds, like those of the watermelon, but not so large. It is eaten in its natural state, though not generally. Some people grow fond of it; but after tasting of it in this state two or three times, I forebore further experiments, having no desire to taste it again. It is much used, however, to flavor ice creams with; it is made into a sauce; mixed with sugar and water, it furnishes a pleasant and cooling beverage; it is preserved; and the jelly which is made from it is capital; such at least was the specimen with which I was treated at the house of a friend in the country.

A guanabana of but common size will weigh two pounds. They are to be seen of two and a half, or even three pounds weight.

ANONA SQUAMOSA. This is the *Sweet Sop*, called by the Spaniards *Anon*. The tree is small. The fruit is of a greenish color, and broken on the outside into scales, or rather knobs, which make it resemble very much a young pine cone. The skin is thick, and the pulp is said to be of a luscious sweet taste. Though this fruit is common in several parts of Cuba, and in the other islands, I never happened to see it.

Anona reticulata; the *Custard Apple,* is said to resemble the former species, but to be a larger tree, bearing a larger fruit, of a dark brown color, the surface of which is netted all over.

Anona cherimolia. The *Cherimoya* is a large, clumsily shaped fruit, irregularly conical, having the pointed end opposite the stalk; that is to say, the reverse of that of the pear. Some specimens are nearly globular.

When ripe, the skin of this fruit is yellow, with or without a blush of red. Cut or break it open, for it is quite soft, and you come to a white, creamy pulp, filled with black seeds, resembling those of the watermelon, smaller, but not so flat. The consistence of this pulp is that of a soft custard, or a rich and smooth ice-cream; and it tastes as much like an ice-cream, very slightly flavored with strawberry, as any thing I can think of, though I do not mean to say that it is as good. By some, who have eaten the Cherimoya in South America, it is vaunted as being superior to the pine apple. Others, however, who have also eaten it there, do not think so much of it, and assert that a fine pear is to be preferred to it. Very probably it is better in certain parts of South America than in the West Indies, but to compare it any where with the princely pine-apple must be nonsense. It is nevertheless, as I have seen and tasted it, a luscious fruit, of which one may easily become fond. It is eaten with a spoon, the skin of the fruit forming the custard-cup; and there is more food in one fruit than any but a hungry man would care to eat at once.

The tree is about the size of a peach-tree, and the foliage is also like the leaves of the peach, and exhibits the scattered appearance which is common to the Anona genus. The fruit stalk is thick and fleshy.

Anona glabra. Spanish name, *Mamon ;* French, *Cachiment cœur bœuf.* This fruit, which is natural to Cuba, seems to be a variety of the Cherimoya, and nearly as good. The skin is brown, smooth, and downy. In the Dictionary of Boïste, the word "Chirimoya" is defined, "cachiment, fruit du cachimentier."

The Anonas are closely allied to the Magnolias, Ranunculuses, Pæonies, &c.

Artocarpus. Of this genus there are two species cultivated, though not extensively, in Cuba ;—the Artocarpus incisa, *Arbol del pan*, or *Bread Fruit,* and the Artocarpus integrifolia, or *Jack Fruit.* The leaves of the former are deeply indented, or palmate, and those of the latter are entire, as their specific names denote. The species which I saw, must have been the incisa, although the proprietor called it the Jack Fruit ; for its large leaves were remarkably palmate. The tree was stout, about thirty or forty feet high ; the lowest branches were the longest ; the foliage was not dense, but free and open, each leaf having plenty of room about it. The fruit was globular, as large as a pumpkin, rough, warty, or knobbed on the outside, and of a green color. A good idea would be given of its appearance, by saying that it was like the seed-ball of our buttonwood or sycamore (Platànus occidentàlis), magnified some hundreds of times. In fact, it strictly belongs to the section of the Platanidæ. The flowers are monœcious; the males disposed in long club-shaped spikes, and the females in round balls, which become the fruit.

Beneath the rough rind of the fruit lie a large number of nuts, in a bed of fleshy farinaceous substance. The nuts, when roasted, are said to be very good; and the other part, baked or roasted, furnishes a delicate bread, and gives its common name to the fruit. The variety most cultivated for food is without nuts, which have become abortive, leaving the inside of the fruit to the entire possession of the bread-like pulp. This variety is propagated by suckers.

The introduction of the bread-fruits into the West Indies from the Islands of the Pacific, is connected with the singular and romantic history of the Bounty and her mutineers, Christian and others, and her brave and persevering commander, Lieutenant, afterwards Admiral Bligh. Though the Bounty and her first cargo of plants were lost, the British government gave Bligh the command of another vessel, the Providence, in which he succeeded in bringing a great number of young trees from Tahiti to Jamaica, and other English Islands. But notwithstanding the high expectations which were formed of the effects of this transplantation, and the pains, expense and danger incurred to realize them, the experiment seems to have failed, in an economical point of view. Owing to the climate or some other cause, the bread-fruit has not come at all into competition with those great staples of support, the banana and the yam, and the planters appear to care little about it. It is to be hoped, however, that the tree will still be cultivated, if it is only for curiosity, variety, and ornament. There is something very captivating in the mere idea of a tree which bears loaves of bread on its branches. It seized the imagination of Lord Byron, who thus poetically, though extravagantly, describes it:

> "The bread-tree, which, without the ploughshare, yields
> The unreaped harvest of unfurrowed fields,
> And bakes its unadulterated loaves
> Without a furnace in unpurchased groves,
> And flings off famine from its fertile breast,
> A priceless market for the gathering guest."

The genus Artocarpus bestows its name on the natural order Artocarpeæ, which is nearly allied to the Urticeæ, or nettle tribe, and likewise to the Mulberries and Figs.

CARICA PAPAYA. The *Papaya*, or *Papaw*. This is but an ordinary fruit for eating, but it grows in a picturesque manner, and belongs to a plant which in several respects is quite remarkable.

The tree has a straight, slender trunk, marked with parallel rings or scores, like many of the palms, and rises to the height of about twenty feet. At the top, is a broad tuft of palmated leaves, resembling those of the Palma Christi, or castor bean, very large, and held by long stiff footstalks, which branch out horizontally, like the sticks of an umbrella. Immediately under this canopy, just where the footstalks diverge from the tree, the fruit, of the shape and size of cantelopes, are clustered regularly and closely round the trunk, to the number of twenty or thirty, and packed together like a bunch of grapes. Grainger compares the cluster to a necklace. The tree grows very rapidly, and the trunk is spongy and hollow, so that in some of the islands it is common to say of a specious, hypocritical person, that he is "as hollow as a papaw."

When ripe, the fruit is yellow, or yellow striped with green, and smooth on the outside. The flesh is also yellow, like a muskmelon, and tastes like a poor specimen of that fruit, or like a ripe cucumber. The interior contains a large quantity of oval seeds, of the shape of pepper corns, rough, black, and tasting like peppergrass, or the seeds of the Nasturtium. The male and female flowers grow on separate trees, and it is therefore only on the female trees that fruit is to be found.

The papaw flourishes in both the Indies. St. Pierre gives it a conspicuous place in his tale of Paul and Virginia; causing his heroine to plant some of its seeds, one of which produces fruit in three years. Grainger characterises it in his poem, as the

"—— quick papaw, whose top is necklaced round
With numerous rows of parti-colored fruit."

But the most remarkable circumstance connected with this tree, is the property ascribed to its juices of acting powerfully on animal matter, so as to make tough or newly killed meat perfectly tender. It is asserted on good authority, that this singular effect is produced by washing the meat with the milky juice, or by mixing a portion of the juice with the water in which the meat is to be boiled, or even by hanging the meat on the tree, and thus exposing it to its exhalations. Living animals, moreover, are intenerated by eating the spoils of this persuasive and affecting plant. "Even old hogs and patriarchal cocks and hens, if fed upon the leaves and fruit, are made in a few hours as tender as young pigs and pullets." So says Burnet, in his "Outlines of Botany." The juice has been preserved and sent to Europe, where it has been subjected to chemical analysis, and found to bear a close affinity itself with animal matter; as is the case also with some of the Fungi.

I was unacquainted with these facts when in Cuba, and therefore did not verify them, and do not state them on my own responsibility; but I have no reason to call them in question.

As the papaw is not very nearly allied to the fig, but is associated with the Gourds, Melons, and Passion flowers, it is time to drop the generic term Carica, and employ that of Papaya. It may be worth while to observe, that the tropical papaw is by no means the papaw of the United States; the latter being an entirely different fruit, and one of the Anonaceæ.

CHRYSOPHYLLUM CAINITO. It is called by the Spaniards *caimito*, and by the French *caimite;* a pretty name, which ought to supersede the English *Star-apple.* It belongs to the order Sapotaceæ, and like its congeners, the Achras and Lucuma, abounds in a milky juice.

The tree is spreading, and of a moderate size. The leaves are dark green above, and downy beneath. The flowers are in small bunches, of a purple hue.

It is one of the handsomest of fruits, both without and within. One of the varieties is of a regularly conical or top shape, the stalk being at the large end or base of the cone; with a smooth, polished, dark purple skin; about the size of a large apple. The skin, though tolerably thick, is tender. If you cut through the fruit transversely, there is the figure of a star in the centre or core, just as there is, only less decidedly, in our apple and pear; and from this appearance it has derived its English name of *Star-apple.* Broad, plump, black seeds, flattened on the sides, with a scar as in the Sapotilla, regularly disposed, and surrounded by a tough gelatinous substance, form the nucleus of the central star.

Nothing can be richer than the appearance of the pulp itself. It consists of innumerable fibres of a sumptuous purple color, intermingled with veins of a thick white cream, which is continually oozing out. It may be likened to a mixture of strawberries and cream, and, though it possesses not the high flavor of that compound, it is very pleasant, sweet, and good. But it should be eaten fully ripe, in order to be properly appreciated.

I have described the purple conical variety. There is another variety which is like it in all respects, except that it is globular instead of conical in form. I have also seen two varieties, one of which is globular, the other conical, which have a green skin and a white pulp, and are smaller than the purple varieties. There may be other varieties still, some of which may deserve to be ranked as species.

CITRUS. This is a well known genus, belonging to the order *Aurantiaceæ,* and common in tropical, and the warmer temperate regions, though said not to be a native of the western world. It includes under it, as species, the orange, lime, lemon, citron, &c. It is known among its congeners by the numerous stamens of its flower, divided into unequal bundles, and by the tough rind of its fruit, which is distinctly and readily separated from the pulp. This rind contains an abundance of essential oil, which seems to guard the pulp for a long time from decay, and renders the fruit easy of exportation from the countries where it is grown. The leaves and flowers, as well as fruit, are covered with receptacles of this fragrant oil. I shall notice those species which I saw in Cuba.

CITRUS AURANTIUM. *Naranja* in Spanish; *Orange* in French and English. All sweet oranges are reckoned by botanists as varieties only of this one species. It is not indigenous in Cuba, but the variety which grows there, and which goes under the name of the Havana or Cuba orange, is one of the very finest of its kind. It is to be remarked also, that of this variety there are sub-varieties; so that in an orange grove, where all the fruit is rich and sweet, there will probably be two or three trees which will be your favorites, on account of the superior flavor of their produce. Observe too, that the blossom end of an orange, or end opposite the stalk, is the sweetest; and where this fruit is in such plenty, that quantities are decaying under the trees, you can well afford to eat only the blossom end, and cast away the rest.

The orange certainly has not so high and exquisite a flavor as the pine-apple, but its sweet and healthful juice is so abundant and so refreshing, it retains its spirit and soundness so long, and offers itself so liberally to all classes in all climates, that I am disposed to think it the most valuable, not only of West Indian, but of all fruits.

CITRUS BIGARADIA. This is the name which botanists have given to the bitter orange in its several varieties. Is it the wild or bitter orange, the *Naranja agria*, of Cuba? You see it every where, when you are in the country. It is very commonly used as a hedge, for which it is admirably calculated. Its thorns are stout and sharp, its wood grows thick and strong, and when well planted and trimmed, it makes a garden fence, or a wayside wall, which is impassable to man and beast. Its deep green, glossy foliage, its fragrant blossoms, its golden fruit, add sweetness and beauty to this powerful hedge. Grainger says to the planter,

> " With limes, with lemons let thy fences glow,
> Grateful to sense ; now children of this clime ;
> And here and there let oranges erect
> Their shapely beauties, and perfume the sky."

But the planters in Cuba seem to prefer the wild orange to the lime or lemon, as a fence.

You meet with single trees in the woods, where it may be regarded as a forest tree. The fruit is large and handsome, but intensely bitter, and uneatable. Its rind is made into a sweetmeat, and its pulp, as I was told, is often used to clean boots with.

Citrus limetta. The *lime ; lima* of the Spanish; *citron* of the French. Wherever I have seen the lime, it has been growing as a bush rather than as a tree. In leaves, flowers, and wood, this species strongly resembles the rest of the family. The fruit is preferred to the lemon in the composition of lemonade.

Citrus limonum. The *lemon*; *limon* of the Spanish; *limon* or *citron* of the French. It is unnecessary to describe this common fruit. The flower may be distinguished from that of the orange, by its being red externally, whereas the orange flower is altogether of a pure white.

CITRUS LUMIA. The *sweet lemon.* This is probably a variety of the lemon, which it resembles in rind and pulp. But instead of being sharply acid to the taste, it is somewhat insipidly sweet. It is not common.

CITRUS DECUMANA. The *Shaddock*, or ***Forbidden Fruit*; *Pompoleon*,** or ***Pompelmousse.*** We occasionally see this fruit, of which there are several varieties, in our market. There is no reason why we should not see it oftener, for it bears transportation as well as the orange, and lasts as long, and brings a good price. The pulp nearly resembles that of the orange, but is coarser, and generally has a slight bitterness of flavor. The rind is very thick, and very bitter. This fruit often grows to an enormous size, and is of a bright golden color. The tree which bears it is spreading in its form, and when thickly laden with its glittering and gigantic fruit, is a magnificent sight to behold. It is said to have been introduced into the West Indies from China by Captain Shaddock, from whom it takes its common name.

CITRUS MEDICA. *Citron* in English; *Cidra* in Spanish; *Cedrat* in French. This fruit is chiefly valued for its thick rind, of which is made a very nice sweetmeat. The pulp is sub-acid, and not very agreeable. Hence it is that we seldom or never see the fresh fruit in our market, while the preserved rind is to be found in all our grocery shops, being in great request for mince pies, wedding cakes, and other savory and attractive compositions. The fruit looks like a very large lemon. The flowers are of a purplish hue externally. The tree is spreading and handsome. It is much more common on the shores of the Mediterranean, than in Cuba, where I only saw one or two trees of this species.

Cocos NUCIFERA. The *coco* or *cocoa;* which is the most commonly known species of a genus belonging to the grand order of the palms.

It is unnecessary to describe the ripe nut, because every child has seen and eaten of it. But it is worth a voyage to the West Indies, or some other tropical part of the world, to see this fruit hanging on its own graceful and glorious tree.

The trunk of the cocoa rises to a height of fifty or sixty, and sometimes even ninety feet, of nearly a uniform thickness. It differs from that of the Royal Palm, (Oreodoxa regia) in always being bent or inclined, in never having a swell, and in being marked, along its whole extent, with deep notches or rings, which are the scars left by the fallen leaves, never obliterated, and so rough and deep that the tree can generally be ascended by their aid. At the summit of this trunk is a waving tuft of dark green, glossy, pinnate leaves, from ten to twenty feet in length, like gigantic plumes; and just under this tuft are suspended the nuts, in long bunches, of all ages and sizes. The trunk easily supports their weight, for though slender, it is very tough and strong, being composed of hard fibres closely compacted together. When the sea or the land breeze is passing through a group of these trees, and the light is glancing from the leaves which are all alive and trembling with joy, and the nuts are clattering on their stalks almost articulately,—it is something to contemplate by the hour, and to be repeated by the memory through a life-time.

The blossoms proceed from a spathe which opens from beneath, and the males and females are arranged together on the same stalk. The males soon drop off, and the females and the quite young and tender fruit look like bunches of pure ivory beads. When the nut has acquired nearly its full size, but while it is yet of a lively green, externally, and before the husk and shell have hardened, it is said to be in the milk, and then furnishes a delightful and healthful beverage. You may thrust a knife through it at one end, as easily as through a cabbage stump, which it much resembles in texture, and having taken out a sufficient plug or tap, just as if you were tapping a melon, you come to a limpid well of water, which completely fills the cavity within. Disposing of this, which may be in quantity about a pint, you may take a spoon, and taste of the pulp which thinly lines the walls of the cavity, and which at this time is as soft as a curd, and has not yet acquired the flavor of the ripe fruit. This is the albumen of the nut or seed, and seems to be secreted from the water contained in it; for the water or milk decreases, as the pulp or albumen acquires thickness and firm consistence.

A coco-nut tree will generally bear, from the seed, in about five years, and in some cases sooner. The bunches of flowers succeed each other, and flowers and ripe fruit may generally be seen together on the same tree.

Round the base of each leaf-stalk is wrapped a coarse fibrous web, which falls off when its protection is no longer needed. These are often to be seen lying under the trees. They are elastic, regularly woven, and large enough to serve as aprons, though rather too clumsy for such a purpose.

This valuable tree and its fruit are put to many uses, which have been often described. I will only observe further, that it loves the salt water, and grows most happily on the very brink of the sea. Grainger refers to this habit, and advises the planter to avail himself of it.

> "——— When near the beach
> Let frequent coco cast its wavy shade;
> 'T is Neptune's tree; and, nourished by the spray,
> Soon round the bending stem's aerial height
> Clusters of mighty nuts, with milk and fruit
> Delicious fraught, hang clattering in the sky."

Cocos CRISPA OR ACULEATA; called in the country, *Corojo*, or *Corocco*. It is a species of the Cocoa, but unlike the *nucifera*, its trunk is not marked by rings, grows erect, and has a swell near the summit. In these respects it more resembles the Royal Palm; looking, indeed, like a Royal Palm in miniature. The trunk, however, though straight, cannot be called smooth, for it is bristling all over with long black spines, as sharp as needles, which are especially numerous on the swell, near the fruit, as if to guard it against intruders. The height of the tree is twenty-five or thirty feet.

The nuts, which are as round as bullets, grow in large pendent bunches, just under the leaves. One of these bunches may weigh twelve or fifteen pounds, and contain as many as five hundred nuts. These are covered externally, as the cocoa-nut is, with a fibrous husk, which, however, is more easily separated from the shell. This is of a yellowish green. Then comes a hard, round, black shell, irregularly grooved, and quite thick and strong, appearing to be of much the same texture as the shell of the cocoa-nut. This encloses the meat, which is solid, white, sweet, of a similar flavor with the cocoa-nut, and about the size of a filbert.

I caused two large bunches of this fruit to be put into the vessel which brought me home, but when they were examined on our arrival, the nuts had all dropped from the bushy stalks, and on being cracked were found to be decayed and worthless. It should be mentioned that they were packed in a close box; had they been hung in the open air, they might have succeeded better.

Jambosa vulgaris, or domestica. The Spanish name is *Manzana de rosa*, or *Poma rosa*; the French, *Pomme rose*, or *Jam-rose*; the English, *Rose apple.*

The tree is one of the most beautiful in Cuba, large and spreading, affording a fine shade. The leaves are ample, oval, pointed, firm and glossy. The blossoms are large, white, and of pleasant odor, and their stamens are so long and numerous that they look like tassels. They are gigantic and fragrant myrtle blossoms.

The fruit is round, or oval, and carinated; has a smooth skin, and is cream-colored without and within. The pulp is of rather a firm consistence, sweet to the taste, and possessing a decided odor of roses, from which last circumstance it derives its common name. It contains one or two seeds. These are round, with a rusty coat, and a green meat, which is also of a rosy fragrance, but is said to be poisonous, or at least very unhealthy. The fruit is eaten when fresh, and though it is palatable, is regarded as being somewhat indigestible. When preserved it is quite nice, and as innocent as most preserves are.

The fresh fruit I did not see; but the tree and blossoms I have often seen and admired. It is of the natural order Myrtaceæ, and was formerly included under the genus Eugènia. The generic term Jambòsa is derived from the word *Schambu*, or *Jambu*, which is the Malay name for the fruit.

Lucuma mammosa. One of the order of the Sapotaceæ, and formerly an Achras. It goes by several names, among which are *Sapote*, *Mammee Sapote*, *Mamey Colorado*, *Bully-berry*.

The tree resembles others of the same order. The fruit is of a conical form, covered with a rough, thick, brown skin or rind; looking like the entire meat of a cocoa-nut, deprived of its husk and shell. The pulp is of a very dark orange or flame color, granular, rather soft, but not juicy, tasting like a pretty good common musk-melon. In the midst of the pulp is a long, boat-shaped seed or stone, sharply pointed at both ends, of a mahogany color and high polish, except where this color and polish is interrupted by the rough scar, which occupies about a third of the surface, from end to end. The whole size of the fruit is from three to six inches in length, and from two to three in thickness. Sometimes there are two seeds in one fruit, always polished and beautiful, and of large size.

There is, I believe, a variety of the Sapote which is oval, and not conical. But I describe the fruit as I saw it in the market of St. Jago, where it is quite common.

MAMMEA AMERICANA. This fruit, as its name imports, is a native American. It is commonly called the *Mamey of St. Domingo—Mamey de Santo Domingo.* The French also call it *l'Abricot de Saint Domingue;* and by the English it is often termed the *Mamey Sapote.* If the unlearned Europeans who go abroad and settle in foreign countries, had not by nature a beautiful way of confounding natural objects together, they would never have thought of bestowing the same name on this fruit which they give to fruits of the Sapotaceous family, which but distantly resemble it. The Mamey is classed with the Garciniaceæ.

Among the umbrageous fruit trees, the Mamey takes the first place. It is a grand leafy pyramid, attaining the height of sixty or seventy feet, and presenting an aspect at the same time regular and luxuriant. The leaves are quite large, nearly a foot in length, of a long oval shape, dark green, leathery, polished and shining. The trunk is stout, and gives excellent timber. No one can behold this tree, towering in the fruit garden, without a sentiment of respect. Grainger, speaking of those trees which will best exclude

> " With their vast umbrage the noon's fervent ray,"

pays a due tribute to this majestic plant, while he notices a native superstition concerning its fruit.

"Thee, verdant mamey, first her song should praise:
Thee, the first natives of these ocean-isles,
Fell anthropophagi, still sacred held;
And from thy large high-flavored fruit abstained
With pious awe; for thine high-flavored fruit
The airy phantoms of their friends deceased
Joyed to regale on. Such their simple creed."

Large and high-flavored the fruit certainly is, but much too solid in its texture, one would think, to be proper food for "airy phantoms." It is noble in its size, as large as a shaddock, or as one's head, globular, with a protuberance or mamelon at the end opposite the stalk, and covered with a russet skin. The pulp is of a close and firm consistency, like that of our quince or cling-stone peach, and of a yellow color. The flavor also resembles that of the peach, though it is more aromatic. It is eaten in its fresh state, but more commonly as a jam or marmalade, in which form it is one of the most exquisite of preserves. Rogers, in his "Voyage of Columbus," introduces, more poetically than Grainger, the idea of the natives respecting the fruit-eating shades of their friends.

"There odorous lamps adorned the festal rite,
And guavas blushed as in the vales of light.
There silent sate many an unbidden Guest,
Whose steadfast looks a secret dread impressed;
Not there forgot the sacred fruit that fed
At nightly feasts the Spirits of the Dead,
Mingling in scenes that mirth to mortals give,
But by their sadness known from those that live.
There met, as erst, within the wonted grove,
Unmarried girls and youths that died for love!
Sons now beheld their ancient sires again,
And sires, alas, their sons in battle slain!"

The Spanish author, however, Peter Martyr, quoted by

Rogers in a note, makes the Guanabana, and not the Mamey, the favorite food of spirits. "They eat of the fruit called Guanàba."

In the centre of the fruit is a stone or seed, of size corresponding to the fruit, brown and very shaggy. Within the rough shell, is a large meat, of the peculiar bitter taste of the peach-stone meat, but more delicate, which is much used for the flavoring of noyeau, and other cordials. Sometimes there are two of these stones, and sometimes three.

MANGIFERA INDICA, OR DOMESTICA. The celebrated *Mango* is now quite common in Cuba, though it was introduced from the East Indies not many years ago. Grainger never mentions it in his poem, which is proof that he never saw it, for it is not a fruit to be passed over. Hughes, in his History of Barbadoes, speaks of a young tree which had just come into bearing, as of a great novelty in that island, and gives a plate of it, which is barely tolerable. I have seen young men who have told me, that within their memory, the mango was a scarce fruit in Cuba, being sold in the market for a *medio*, or the sixteenth of a dollar apiece. The same money will now buy almost any quantity you may want to eat. The climate and soil of the country have agreed with the trees so well, that in some places they have multiplied spontaneously into groves and even forests, and they bear in the greatest profusion.

The tree is one of the most beautiful of fruit trees. The leaves are long, lanceolate, polished, hanging in dense masses of dark green foliage,—so dark, that the orange trees look quite light by their side. The trunk is sturdy, and the branches spread equally, giving a full, regular, rounded form to the whole tree, which is about the size of a healthy and well-grown apple tree.

The blossoms are small, whitish, or with a red tinge, growing in upright spikes. When the fruit is formed, the spikes are reversed by its weight, and the mangoes appear among the leaves in long pendent bunches.

While the fruit is young, its color is a fresh and lively green, which is a treat to one's eyes. When it ripens, it generally turns yellow, and looks like a first rate egg-plum, only twice as large. Some of the varieties are yellow, with a red blush on one side, and some hardly part with their green. The flesh is of a bright yellow, and juite juicy. The juice is thick, creamy and luscious, and, together with a rich sweetness, possesses a peculiar aromatic flavor, resembling that of turpentine, which in some species is so strong as to be disagreeable to the uninitiated. This thick juice composes nearly the whole of the fruit, which may be sucked away into the mouth, so that nothing but the stone and a mass of fibres will be left. The stone is long, compressed, boat-shaped, without polish, irregularly grooved, and covered with hairs or fibres which penetrate the fruit and cause it to adhere closely.

There are a vast many varieties of this fruit in the East Indies, and there are several in Cuba. The French names of some of them, are *Mango filandreux*, *M. savoneux*, *M. abricot*, *M. cœur*. Of these the *Mango cœur*, or *Heart Mango* is much the best, and is also one of the largest. It is more delicate, and has less of the turpentine flavor than the others. It derives its name from its shape.

Though the mango tree is so ornamental, and its fruit is so fine, it is thought by some planters to be for their interest, not to suffer it to grow on their estates. The trees, they say, shade their coffee, and the fruit is prejudicial to the health of their negroes, who are very fond of it, and apt to eat it immoderately. With regard to the coffee, it is a pity indeed, if a few bushes cannot be given up for the sake of the shade and ornament which the mango affords; and with regard to the negroes, it is held by other planters that the fruit is good for them, and does them no manner of harm. I suspect that the whole question of benefit or hurt, depends on the moderate or immoderate use of the fruit.

MUSA. Two species of this genus, the MUSA SAPIENTUM, or *Banana*, and the MUSA PARADISIACA, or *Plantain*, are cultivated in Cuba, as in most tropical countries. The Spanish name for both the Banana and Plantain is *Platano*, while the French name for both is *Banane*. It is common, however, in the latter language, to distinguish the Banana by calling it *Figue Banane*, and to designate the Plantain by the term *Grosse Banane*. The Spaniards, according to La Sagra's catalogue, apply the term *Platano hembra* to the Plantain, and *Platano Guineo* to the Banana. Some botanists regard them as varieties only of the same plant, and not distinct species. However this may be, it is convenient to speak of them as distinct species, and there are certain slight marks which distinguish them from each other. The stem of the *M. sapientum*, or Banana, is spotted with purple; that of the Plantain is uniformly green. The fruit of the Banana is smaller and more delicate than that of the Plantain, though perhaps the latter is more in request as an article of food.

This fruit is occasionally seen in our market, and is more common in the markets of the cities to the south of us. It is not necessary, therefore, that I should describe it, farther than by saying that it is of a long oval shape, somewhat curved, pointed at the ends, of a yellow or purplish color when ripe, and of a sweet, luscious taste. The outside skin readily peals off lengthwise, and the rich pulp then presents itself, of the consistence of butter. It is eaten raw, or cooked in various ways.

The stem of the plant is not woody, but consists of the footstalks of the former leaves wrapped round each other, and it rises to the height of twelve or fifteen feet. The leaves are very large, of a long oval form, five or six feet in length, and of a beautiful green. The middle rib of the leaf is tough and strong, but the rest of its substance is thin and delicate, and is easily torn by the wind alone, in a direction of right angles with the rib.

The manner in which the fruit is developed is quite interesting. From the midst of the leaves, and at top, appears a large, smooth, purple cone, hanging down gracefully at the end of a stalk. The flowers are all wrapped up in this cone, which consists of a large number of closely packed spathes. By and by, the uppermost of these spathes disengages itself from the rest, curls up, and discloses a row of three or four long blossoms, with the young fruit of each beginning to form. While this row of fruit is tender, the spathe remains hanging over it like a roof; but when the fruit has acquired some size and strength, the protecting spathe drops off, and the next in order rises up, with a similar row of young fruit, over which it stands in the same watchful attitude, till it also drops off, to be succeeded by another. When one circle of fruit is completed, another is commenced below, and in due time another; while the common stem around which the fruit is disposed, grows constantly longer, and the cone of spathes is constantly diminishing in size, till it is all unfolded, and a monstrous bunch of bananas is finished, which seldom weighs less than twenty or thirty, and sometimes as much as seventy or eighty pounds.

Of all kinds of vegetable nutriment the banana is perhaps the most productive and most easily raised. After a plant has produced its bunch of fruit, the stem is either cut, or is suffered to wither and fall on the spot. In the former case, it is good fodder for cattle, in the latter, it is good manure for the young shoots which have been springing from the root, and which are soon ready to bear fruit in their turn. From these shoots or sprouts the plant is propagated.

There are several varieties both of the Plantain and the Banana. The Banana which comes from Tahiti, is among the very best. The East India name for the genus is *Pisang*.

This fruit is not forgotten by Grainger.

> "A wholesome nutriment bananas yield,
> And sunburnt labor loves its breezy shade.
> Their graceful screen let kindred plantanes join,
> And with their broad vans shiver in the breeze."

Passiflora. The seed vessels of several species of the Passiflòra or Passion-flower, are palatable fruits in countries where they come naturally to perfection. This fruit is called *Grenadillo* or *Passionario*, by the Spaniards, and *Grenadille* by the French ; which name has been also adopted by the English, with a slight difference in termination, who call it *Granadilla*. The Spaniards of South America, however, and perhaps also of Mexico, give quite a different name to this class of fruits, terming them *Parchas*.

With one species of Granadilla I became well acquainted, for it grew just by my window. The plant, which was, I believe, the *Passiflòra quadrangulàris*, was a most luxuriant vine, clambering over a wild orange tree, and so completely enveloping it as hardly to suffer a twig to make its appearance. Its growth was so rapid, that it could almost be seen, and as it grew, it threw out fresh flowers ; while hanging about in all parts of this natural arbor, was the fruit, in all its several stages up to ripeness, when it was of the size of a cantelope melon, say seven or eight inches by four. It was of an oval form, smooth like an egg-plant, and of a yellowish green color, when ripe. Within a tender rind, a quantity of blackish seeds swim in a transparent mucilaginous pulp, of a rather pleasant sub-acid flavor. This pulp is made into a refreshing drink, when mixed with sugar-syrup and water ; but without preparation it was not much to my taste. Surrounded as I was by other and better fruits, I hardly ever thought of reaching forth my hand to this.

Grainger pays a due compliment to the ornamental character of the plant.

> " The muse might teach to twine the verdant arch,
> And the cool alcove's lofty roof adorn
> With ponderous granadillas."

The Passion-flowers give their name to the natural order Passifloraceæ, and are nearly allied to the Gooseberries and Currants.

Persea gratissima; formerly Laurus Persea. No fruit enjoys a greater wealth of names than this; and therefore it is rich in more senses than one. It is the *Alligator Pear* of the English, which name Alligator is only a corruption of the *Avocato* or *Aguacate* of the Spanish, or *Avocat* of the French. It is also called the *Vegetable Marrow* by the English, a name which well designates its quality. In Peru and Mexico it is most commonly called *Palto* or *Palta;* and Grainger gives us yet another, which he says is the Indian name, when he terms it in his poem the "rich *Sabbaca.*" But in another place he employs the more usual appellation.

> "And thou, green avocato, charm of sense,
> Thy ripened marrow liberally bestow'st."

The tree is of middle size, and looks so much like our sassafras tree (Laurus sassafras), that it might easily be mistaken for it at a little distance. In this resemblance it is true to its family connexion; for it is one of the Laurels, and is therefore closely allied with the Sassafras, as well as with the Bays, the Cinnamon, and the Camphor.

The fruit looks like a very large, long pear. It is of two or three varieties, red, purple and green; of which the green is the best. The pulp is yellow, and of a firm but very rich and delicate consistence. "When ripe," says Grainger in a note, "the skin peels easily off, and discovers a butyraceous, or rather a marrowy-like substance, with greenish veins interspersed. Being eat with salt and pepper, or sugar and lime juice, it is not only agreeable, but highly nourishing; hence Sir Hans Sloane used to style it Vegetable Marrow." It was once thought to be worth a voyage from Europe to the West Indies, to taste of this fruit; but now, its ancient fame is somewhat diminished, though it is still considered a great delicacy. It seems to have the character of a vegetable rather than a fruit, and is more highly appreciated by some palates than by others.

As the Aguacate does not ripen till summer, I had not the opportunity of giving it a trial. I saw many of the trees, however, and some specimens of the fruit which had attained a large size.

Imbedded in the pulp is a large rough seed or stone, the juice of which stains a violet color, and is sometimes used for marking linen.

PSIDIUM. Of this genus, which is of the natural order Myrtaceæ, two fruit-bearing species are commonly mentioned as belonging to Cuba, the POMIFERUM and PYRIFERUM; the fruit of the former being shaped like an apple, and that of the latter like a pear. It is the *Guava*, or as it is variously written by the French and Spanish, *Guaiava*, *Gouyava*, *Guayaba*, *Goyabe*, &c.

The tree is small, looking something like our cherry tree when young; though the leaves of the Guava are larger and longer than those of the cherry, and more thinly scattered on the tree. It is natural to Cuba, and is of a pertinacious life, covering and usurping the ground on which it is permitted to settle. The wood is close grained, heavy, clothed with a smooth, reddish colored bark. The blossom is white, and resembles a plum or cherry blossom, or more nearly still a large myrtle flower.

The fruit which makes such a fine and celebrated jelly, is not so very desirable in its natural state, though by some it is esteemed. I happened to see but one species, but of this one I saw many specimens. The fruit was nearly round, and, when ripe, of a greenish yellow, resembling more nearly a ripe lime, as I thought, than either an apple or a pear. It was so like a lime, both in shape and color, that at a little distance, I should easily have mistaken it for that fruit. It had a tender rind, about a quarter of an inch thick, within which was the pulp, of a pink hue, crowded with small, triangular, yellowish seeds. The flavor of the fresh fruit is like that of the jelly made from it, but much more powerful, so that one of them, cut open, will scent a large room. Grainger has but a line and a half to spare for it.

> "A wholesome food the ripened guava yields,
> Boast of the housewife."

The name Psidium is from the Greek *ψιδιον*, which was the ancient name for the pomegranate, to which the guava has some resemblance. There is a wild guava, P. *montànum*, the fruit of which is small and not fit for food.

PUNICA GRANATUM. The *Pomegranate* grows well in Cuba, but is a native of the old world. It flourishes abundantly on the northern coasts of Africa, especially in the Carthaginian district, from which country it derives its generic name. The ancients called it *Malum*

Pūnicum, or the Carthaginian apple. Its specific name appears in the English *Pomegranate*, or apple full of seeds, and also in the French *Granade*, and the Spanish *Granada.*

The tree, or bush, is common in our green-houses, and the fruit is now and then to be seen in our market. I will only say of the former, that it resembles in appearance, as it is also naturally allied with, the bushy plants of the order Myrtaceæ ; and of the latter, that it is round in form, terminated with a tall and deeply cleft coronet, and full of small seeds which are enclosed separately in portions of a transparent red pulp, firm, glistening like rubies. These grains furnish a refreshing juice, in which sweetness and acidity seem blended in equal proportions. I have seen the plant occasionally in the city of St. Jago, lighting up some small yard with its fresh and varied beauty, and also flourishing here and there on a plantation walk. The ripe fruit, sometimes bursting and disclosing its gems, the shapely green fruit, the rich red blossoms, all hanging together on the slender pensile stems of the bush, form one of the pleasantest of garden sights.

TAMARINDUS OCCIDENTALIS. *Tamarindo ;* the *Tamarind.* I have employed the specific name OCCIDENTALIS, because it has been adopted by late botanists to distinguish the West Indian tamarind. As it seems to differ, however, from the TAMARINDUS INDICA, or East Indian tamarind, in no other respect than merely having shorter pods or fruit, it hardly deserves to be esteemed but as a variety of that species.

It is one of the Leguminosæ, and the tree has all the appearance of a fine, spreading acacia. It grows fast, and yet is long lived, and its wood is hard and durable.

The fruit is a pod, like a full, ripe pea pod, with a thin, crisp, russet skin or shell, which covers a reddish brown pulp, and shining, mahogany colored seeds, which are embraced by a net of tough fibres, proceeding from the fruit-stalk. The pulp seems to need no preserving process, for when fresh it has all the appearance of a marmalade. When eaten directly from the tree, its sugared acidity is agreeable to the palate and refreshing to the senses. Steeped in water, it furnishes a cooling and grateful drink in fevers. The old writers are loud in its praises, and ascribe to it, together with its real good qualities, properties which it can lay but slight claim to. The least that Lemery says of it, is, that "it allays by its sharpness the too great motion of the humors, abates feverish heat, cools and quenches thirst, strengthens the stomach, creates an appetite, resists vomiting, and cuts tough phlegm." At any rate, it is pleasant and innocent, and it is so commonly to be met with in our shops, that there is no want of opportunity to test all the virtues it may have.

The beauty of the tree is increased by its blossoms, which hang in bunches, with red and yellow petals, and of an agreeable fragrance.

Grainger informs us in a note, that its name in Arabic is *Tamara,* and that its fruit is good in sea-sickness. He thus instructs his muse to celebrate it:

> "The tamarind likewise should adorn her theme,
> With whose tart fruit the sweltering fever loves
> To quench his thirst; whose breezy umbrage soon
> Shades the pleased planter, shades his children long."

And another, and far higher poet, in that strange and beautiful romance of "Thalaba," introduces the maid Oneiza proffering a draught of tamarind water to the guest of her father's tent, unconscious that this guest is a concealed sorcerer.

> "The damsel from the tamarind tree
>   Had plucked its acid fruit,
>   And steeped it in water long;
> And whoso drank of the cooling draught
>   He would not wish for wine.
> This to the guest the damsel brought,
> And a modest pleasure kindled her cheek,
> When raising from the cup his moistened lips,
> The stranger smiled, and praised, and drank again."

The following curious account of the derivation of the name Tamarind, is from Burton's Outlines of Botany: "The date, called *Tamar* by the Arabs, being their most common and valuable fruit, other important fruits have been called dates, or *tamars* likewise, with some distinctive epithet adjoined. Hence the one in question received the name of *Tamar-hendi*, the date of India, whence our word *Tamarind.* Ignorance or neglect of this circumstance led botanists to add *Indica* as the specific name, to a generic one in which the habitat of the plant already was included." Considering therefore that *Tamar-indus Indica* is a "vile pleonasm," Burton proposes to call it *Tamarindus orientàlis*, in distinction from the *Tamarindus occidentalis.*

Theobroma cacao. This is the plant which produces the *Cacáo* or Chocolate-nut of commerce; and it is important that the true spelling and pronunciation of the word should be attended to and preserved, in order to prevent the confusion arising between this and the coco or cocoa, which is as different a fruit as possible. The nut from which chocolate is made, is the *cacào*, and not the coco; and the tree which bears it, instead of being one of the Palms, is classed among the Mallows, and is connected with the cotton shrub and tree, the linden, and other plants of that type.

The tree is of rather small size, with large, long, oval pointed leaves, strongly ribbed, often assuming a dark purple color. The flowers are small and star-shaped. The fruit is of a long oval form, pointed at the end, ribbed like a muskmelon, and bearing some resemblance to a small specimen of that fruit. When ripe, its rind is yellow. Cut it open, and you come to a soft, white, spongy pulp, of a rather pleasant sub-acid taste, which separates whole from the rind. The valuable seeds are wrapped up carefully in this pulp, in separate envelopments, in considerable numbers, and are of a lively red color before they are dried, when they turn to a duller hue, which is well known as chocolate color. A specimen of the fruit which I opened contained thirty-eight of these seeds.

A singularity with respect to this fruit, still more marked than in the case of the guanàvana, is, that it grows out directly from the bark of the large branches or trunk, hanging thereto by a short, fleshy stem. I have seen it clinging to a stout trunk, within a foot or two of the ground, without a twig or a leaf near it.

It is unnecessary for me to say any thing of the value of the cacào. When first discovered by Europeans, it was greeted with boundless eulogy, of which its generic name, Theobròma, signifying *food for the gods*, is a standing testimonial. In Mexico and parts of South America, the people could hardly live without their chocolate, or *chocolatl*, which is the Mexican word; and it was calculated by Humboldt, in the year 1806, that twenty-three millions of pounds of the cacào were imported into Europe, the greater portion of which was used in Spain. Chocolate is nothing more than the cacào seeds bruised or ground into a paste, and sweetened and flavored according to the fancy of the manufacturer and demands of the consumer.

Here I close my account of the Fruits of Cuba. I might have swelled it into more ample dimensions by discoursing more fully concerning their properties and uses, medicinal and economical, real or supposed, but this might have proved tedious, and would only have been repeating what has been published by Sir Hans Sloane, Jacquin, Jeffrys and others, and copied into cyclopedias and books of useful knowledge.

Beside the fruits which I have described, there are a few others of inferior note, of which I can give no satisfactory account. Two or three kinds of nuts were mentioned to me in Cuba, but I did not see them. Just before my departure, a fruit was brought to market, called by the French *Cirouelle*, but by the English by the less euphonous name *Hog-plum*. It looked like a small, irregular, dark red apple; had a yellow flesh, which was juicy, and of a spirited, agreeable taste; and in the centre a large rough stone or seed. It is, I believe, a species of the genus SPONDIAS. Another fruit I saw, called by the French, *Grosaille de la Chine*, of a pale yellow color, small in size, thickly clustering round the branches of a pretty tree, with compound leaves like the mountain ash. It may be the CICCA RACEMOSA. This fruit is acid, and chiefly valued as making a good preserve. The fruits of the OPUNTIÆ, or *Prickly Pears*, and of some species of the CACTI, are also eaten occasionally.

I feel that I have enjoyed a great privilege in being permitted to behold the luxuriant forms of vegetation which Providence has allotted to a tropical clime. We have in our colder region no tree which can give any idea of the wonderful grace of the cocoa-nut tree; and the oranges, hanging amid dense and glossy foliage all the year round,

> "Like golden lamps in a green night,"

offering to the thirsty lips their fountains of delicious and healthy liquid, are a glory with which our orchards can hardly vie. And yet, if I were asked how the fruits of Cuba compared with our own, I should say, that leaving out the pine-apple and orange, with the taste of both of which we are familiar, those fruits are inferior to our own. He who can begin the summer with strawberries (and cream), and pass on through the varied season with his fair share of cherries, raspberries, peaches, plums, pears, not forgetting the hedge and field fruits, blackberries, thimbleberries, gooseberries and whortleberries, have a peck or two of shagbarks and chestnuts dropped into his basket in the frosty mornings of November, and a few barrels of good apples rolled into his cellar for winter use, has no good reason to be dissatisfied with the fruits of his own soil, or to envy the inhabitants of Cuba the enjoyment of theirs.

ART. X.—AN ENUMERATION OF SOME LICHENES OF NEW ENGLAND, WITH REMARKS. By EDWARD TUCKERMAN, JR. Dane Coll., Cambridge. (Read Dec. 5th, 1838.)

THE following list, beside some lichens of our neighborhood, which do not seem to have been hitherto noticed, comprises such Alpine species as I have been able to discover, in two visits to some of the mountains of New Hampshire and Vermont. These last represent only the more remarkable forms of our alpine lichens. The novelty and beauty of the higher orders of vegetation in those elevated regions, is enough to engross the most ardent botanist; and the brief period that he can give to his researches, will leave him at his return, however richly laden with the spoils of Flora, still disposed to remember that he passed over much. It will probably be long before the Lichens of our Alps are thoroughly known, and hence the briefest catalogue acquires some value. But I am sensible that in attempting to refer, correctly, species in some degree new to our Flora, I shall be exposed to frequent mistakes. The subject is one of difficulty and frequent doubt, and though I have endeavored to exclude from this paper, every species, however interesting, in regard to which I could not speak with some confidence, I still fear there will be much room for consideration. It should, however, be borne in mind that the student of cryptogamous plants can pursue his investigations with little satisfaction, while our New England Flora is still an unfinished work.

The species succeed each other in the arrangement of Feé as modified by Hooker.

Bæomyces *rufus*, Wahlenb. β, rupéstris, Schær.! Lich. Helv., Hook. Br. Fl., B. rupéstris, Pers., Ach. Meth., B. rufus, Hals. Syn. View.

Rocks; sub-alpine regions of Mount Washington.

B. *ròseus*, Pers., Ach. Meth. etc., Muhl. Cat., etc.

Clay-soils; Newburyport Turnpike, also Plainfield! Porter, and probably not uncommon elsewhere.

Calicium *séssile*, Pers. (cit. Ach.), Turn. & Borr. in Hook., and E. Bot. t. 2520. C. stigonéllum, Ach., Meth., Muhl. Cat., Torr. Cat., Hals., and C. turbinàtum, auct. Cyphèlium stigonéllum, Ach. in Act. Holm. 1815, 268. Parasitick on Pertusària commùnis; Cambridge.

Cyphelium *tigillàre*, Ach. in Act. Holm. 1815, 266. Acòlium tigillàre, Feé, (cit. Spreng.) Calícium tigillàre, Ach. Syn., Pers., (cit. Ach.) Schær.! Hals., Port.! in Mass. Cat., Lecídea tigillàris, Ach. Meth. (cum. Ic.) and Lichenogr. Univ. Old rails, common; Cambridge, Brighton, &c. This differs so considerably from the other species with almost sessile pilidia, that it would almost seem to constitute a distinct genus. The position given it in this place is doubtful, as in the paper above referred to in the Stockholm transactions, which is part of a full account of the "Calicioidea," Acharius enumerates ten species of Cyphèlium. I only know of Feé's proposed arrangement, from the citation in Sprengel, (Spreng. Syst.).

Endocarpon *miniàtum*, Ach. α, umbilicàtum, Schær.! Hook., E. miniàtum, Ach., Muhl., Hals., Mass. Cat.

Berkshire, Mass. Cat. Brookline, on dry ledges; abundant.

———————, γ, aquáticum, Schær.! Hook., E. Wéberi, Ach., Hals., Port.! E. miniàtum, Torr.?

Plainfield! Porter. Rocky bed of a mountain brook, Highgate, Vt.

E. *pusillum*, Hedw. (cit. Ach.) Spreng. Syst. E. Hedvígii, Ach., Schær.! Hook., Muhl., Hals., Porter.

Rocks, Brighton. The scales are very small in our variety of this plant, so as to suggest its near affinity to E. smarágdulum; from which it principally differs in color.

Lepraria, Ach. Meth. Lichenogr. and Syn., Schær., Turn. and Borr., Hook., Halsey. The above authorities, beside others, locate this genus among the lichenes; and it is enumerated among the "true lichenes" of Feé and Hooker. Still its location must be regarded doubtful. "Fere omnes satis paradoxæ videntur, et forsan tantum initia aliorum lichenum," says Acharius, (Meth. p. 3, and vide p. 12.) "Vix hujus familiæ," etc., yet more strongly assert Dubis and De Candolle, cited by Hooker. And the last author, while he adopts the arrangement of Turner and Borrer, yet remarks, that "if L. viridis" (the Chlorocóccum, a genus of Algæ, of Greville), "be removed to the Algæ, so should the rest of the Lepràriæ." Still it may be said, that these plants appear to have affinity to some lichens, and that their structure is of such extreme simplicity, that in the present state of knowledge, we may as safely call them Lichenes as Algæ. I have discovered four forms of

Leprària in this vicinity, three of which answer generally to L. flava, Ach., Hook., on old rails; L. alba, Ach., Meth., on trees; L. cinèreo-sulphùrea, Flörke, Ach., Schær.! Hook., on sandy banks, Cambridge; and the other on trees, undetermined; but I do not venture to say with confidence that either of these species is correctly referred.

URCEOLARIA *scrupòsa,* Ach. Meth., Schær.! Hook.

Cambridge and Watertown, not common; on rocks, and on the ground in sandy soils. The remarkable ε, bryóphila, Ach., Meth., Schær., (U. bryóphila, Ach. Lich. Univ., Gyalècta bryóphila, Ach. Syn.) mentioned by Muhlenberg, is the only form of Urceolària, akin to this, that I find in any of our catalogues.

U. *cinèrea,* Ach. Meth., Schær.! Hook., Halsey.

Cambridge, old stone walls; common. There is probably one other form of Urceolària in this vicinity, with the last. The genus is not mentioned in the Massachusetts catalogue.

LECIDEA *obscuràta?* Schær.! (spec. in Lich. Helv., sine desc.). Rocks on the peak of Mount Washington. I suppose Schærer's name will be allowed on the authority of his specimen; though I do not know that any description of the lichen has been published. It is a very obscure plant, presenting nothing to the naked eye, but somewhat immersed, black patellulæ. The thallus, often evanescent, is smooth, and of a yellowish brown color.

L. *synòthea,* Ach. Syn., Borr. in E. Bot. t. 2711. Hook. Old squared rails and posts, Cambridge. A very obscure lichen. The apothecia (appearing black to the naked eye), are dark-brown.

L. *dùbia*, Turn. and Borr. in Hook., Lichen dùbius, E. Bot. t. 2347. Old rails, with the last, Cambridge.

L. *pinicola*, Borr. in Hook., L. parasèma, β, and δ, Ach. Syn., (sec. Borr.), Parmèlia exígua, β, Ach. Meth., Lichen pinícola, Ach. Prodr. (not Meth. as cited in Hook.). Scaly bark of old pine trees, as found by Acharius and Borrer; Cambridge.

Of the Lecídeæ of this vicinity, I have a number undetermined, and many doubtless remain to be discovered. Eleven species are enumerated in the Mass. Cat., some of which being common every where, do not require any mention here.

LECANÒRA *ventòsa*, Ach. Lichenogr. Univ., Schær.!, Hals. Alpine rocks on Mt. Washington, abundant. A very handsome species.

L. *fulva*, Schwein. in Hals. (cum Ic.), Mass. Cat.

Old Elms, Cambridge. Not uncommon in this region. Twelve other species of this genus, no less difficult, and hardly less extensive than the last, have been found in this vicinity.

SQUAMARIA *rubina*, Hoffm. (cit. Schær.), Lecanòra chrysolèuca, Ach. Syn., Parmèlia chrysolèuca, Ach. Meth., Lichen chrysolèucus, Smith. Cambridge, Watertown, on rocks; rare. This is a remarkable form, and with SS. crassa, lipària, and Smithii, form a natural group well distinguished from the true Lecanòræ. Thallus composed of closely aggregated thick segments, the whole often half an inch through, of a light green above, and tawny on the under side. Scutellæ large, disk golden-yellow, border thin and waved.

Placòdium, De Cand., Feé, Hooker. The leafy Lecideæ and Lecanòræ, are arranged in three genera by Hooker, and form together the natural family Squamarieæ. The present genus has "the fructification of Lecidea, with the thallus of Squamària." We have a plant in this neighborhood, which seems to present all the characters of Placòdium, while I do not find any specific description answering to it. It may be described as having an imbricated thallus of small lobules; the lobules somewhat regularly trifid, with rounded apices, and raised margins; the patéllulæ small, black, solitary, in the centre of each lobule. This curious plant presents very little to the naked eye, beside a loose black crust. On every specimen that I have examined, I I have found (beside the apothecia) regular heaps of brownish grains or globules, which may be propagula, or possibly parasitick. On ledges in Brookline, in company with Endocarpon miniàtum, *α*, abundant.

Parmelia *conspérsa*, Ach. Meth. etc., Muhl., Torr., Hals.; omitted in the Mass. Catalogue, but common on walls and stones, in this vicinity.

P. *pariétina*, Ach. Meth., Schær !, Hook., Mass. Cat., Lichen pariétinus, L., and E. Bot. t. 194, and PP. rùtilans and aurèola, Ach. (sec. Spreng.), P. rùtilans Hals. ?, P. rùtilans, Port. !, Rails, boarded buildings &c. very common.

To this lichen, Sprengel cites Meyer as referring a number of forms now located in different genera. And it is stated in Lindley's Introduction, that Meyer's conclusion was the result of actual study of the plants in all their stages. So far as Squamària is concerned, this discovery will only remove a somewhat anomalous form from that genus.

P. *sty'gia*, Ach. Meth., Schær.!, E. Bot. t. 2048, Hook., Lichen stygius, L. Alpine rocks on the peak of Mt. Washington, below the summit. Standing here, at an elevation of nearly six thousand feet, I gathered the lichens of St. Gothard and Ben Nevis. Nor were inspiring memories wanting of him, who made Lapponian Alps poetic ground; as on the rocks, and little patches of sedgy pasture of Mount Washington, I hailed the forms that he discovered and illustrated. And this I felt was no unworthy enthusiasm. The eloquent words of Garden came back with freshened force upon my mind, and with him I said:—It is "our duty to our fellow-creatures, which obliges us, as members of the great society, to contribute our mite towards a proper knowledge of the works of our Common Father." (Garden to Ellis, 13th Jan. 1756, Linn. Corresp.).

In all, I have twenty-four species of the genus Parmèlia, collected in New England. There are probably some Alpine forms, not yet ascertained.

Sticta *crocàta*, Ach. This lichen, only surpassed by S. auràta in beauty, and with it, commonly an inhabitant of tropical regions, was discovered by Dr. Porter at Ashfield, from which station I have a specimen. Dr. Porter has since found it in Plainfield, and I have had the good fortune to detect it, in fine condition, on wood from this vicinity. Muhlenberg's plant is doubtful, by his own mark. Massachusetts, is the only station given by Halsey. No other American botanists seem to have noticed it.

S. *pulmonàcea,* is I believe, rare in the fructified state. I gathered ample specimens in this condition, on trees in the lower regions of the White Mountains.

Collema *saturnìnum*, Ach. Lichenogr. Univ., Schær.! E. Bot. t. 1980, Hook., Collèma tomentòsum, Hoffm., (cit. Ach.) Parmèlia saturnìna, Ach. Meth., Lichen saturnìnus, Smith, (Linn. Trans. I. 84.) On trees in sandy pine woods, Cambridge and Watertown; but not as yet found in fructification, which is said by Hooker to be "very scarce." Is not Hoffmann's name of prior authority?

Growing with the last, we have a plant answering generally to such descriptions as I have seen of C. pulchéllum. That species is enumerated by Muhlenberg, but not to my knowledge, by any other American botanist.

Peltigera, Hoffm. This genus, excluding the Solorinæ and Nephròmata, I adopted in labelling my species, on the authority of Schærer, Sprengel, and Montagne, as of prior authority to the Peltìdea of Acharius. Indeed Acharius himself cites Hoffmann's names as Synonymes of his species, in the earliest work in which his Peltìdea appeared. The form called Peltìdea spùria in Ach. Meth., Hook., which is the "Peltìgera spùria, Germanor. et Anglor." of Schær.!, and reduced by Spreng. to Peltìgera rufèscens, Hoffm., occurs very distinctly on sands in Cambridge. Its "small ascendant fronds, almost every lobe of which is fertile," together with its "rather large apothecia," and the very light ash-color of the upper surface, separate the plant instantly from the ordinary states of P. canina. Still Acharius, in his latest work, referred it to that species, and Hooker is "not able at all times to distinguish them." With the above is found what I take for the Peltidea rufèscens of Ach., (the P. canina, *β*, crispa, of Ach. Syn., & Schær. !) Sprengel's Peltigera rufèscens as above cited, is constituted of this and P. spùria; and perhaps his arrangement will be found more natural than that which proposes to make both these species varieties of P. canina.

Nephròma *polàris*, Ach. Lichenogr. Univ., Peltigera polàris, Spreng., Peltidea polàris, Ach. Meth., Lichen Grönlàndicus, Fl. Dan., L. antárcticus, Jacq., L. árcticus, L. Alpine rocks on the side of Mt. Pleasant, (White Mts.) abundant and fine; but not observed elsewhere. I have not had the opportunity of comparing this with any specimens of N. polàris, but it perfectly answers the descriptions. N. polàris is, according to Sprengel, an inhabitant of both the arctic and antarctic regions of America, but it has never before been published as belonging to our United States Flora. I took the precaution of gathering abundant specimens, and shall therefore be able to exchange.

N. *resupinàta*. There is a fine station for this lichen, in the Notch of the White Mountains; on the high perpendicular rocks, at the narrowest part of the pass.

Gyróphora, Ach. This name is almost universally adopted. Yet I cannot satisfy myself that the genus

Umbilicària of Hoffmann has not prior authority. This last is adopted by Schærer, (sec. Hook., but not in his Lich. Helvet., at least not in the Cambridge copy,) and several others. Without the works of Hoffmann, however, we cannot expect to arrive at any satisfactory conclusion. The genus being one of considerable interest, I will enumerate all the New England species in my herbarium, though it is an imperfect list even of the known species.

1. G. *proboscídea*, Ach. Meth., Hook., G. polymórpha, β. Schær., Umbilicària corrugàta, Hoffm. (sec. Ach. Meth.), U. congésta, Hoffm. (sec. Hook.), Lichen proboscídeus, Ach. Prodr. Alpine rocks on the peak of Mount Washington.

——————— β. àrctica, Ach., Hook., G. polymórpha, α, Schær.!, γ, àrctica, Ach. Meth. (cum Ic.). Mt. Washington with the last. It will be recollected that the *base* of the peak of Mt. Washington, has an elevation of about 5000 feet. The peak rises about 1200 feet above this. It is composed of detached masses of naked *mica-slate** rock, diversified only with here and there a little patch of carices or Diapensias, but every where rich indeed in matter for the lichenist's enjoyment.

2. G. *deústa*, Mass. Cat., Mt. Washington, with the last. Also Cambridge, (one, on an old wall,) and ex Porter.

The Cambridge plant, and that from the White Mountains, are identical with Dr. Porter's, and agree very well with the original description in Ach. Meth. They do not so well answer to Hooker's description of the

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* Prof. Hubbard; Sill. Jour. xxxiv. 121.

British plant, nor to Schærer's specimen of the Swiss. The latter is however what Acharius called his var. γ, flocculòsa, and perhaps Hooker has incorporated the variety into his description, as he does not notice it apart. *Our* plant is certainly distinct from G. proboscidea; but I am not sure that it will prove to belong to G. deústa.

3. G. *eròsa?* Ach. Meth., Schær.! Hook., Umbilicària eròsa, Hoffm., Lichen torrefáctus, Lightfoot. Alpine rocks; White Mountains. In the course of another visit to this station, I hope to remove the doubt with which I am now compelled to mention it.

4. G. *papulòsa*, Ach. Syn. (cit. Hals.) Muhl., Torr., Hals., Mass. Cat. Rocks; Berkshire, Mass. Cat.; Mt. Ascutney, Vt., and White Mts. (in the Notch).

5. G. *véllea*, Ach. Meth., Muhl., Torr., Hals., Mass. Cat. Rocks; Phillips's point, Dr. Gould; Lynn Hills; Bear Hill, Waltham; Mt. Ascutney, Vt.; White Mountains (in the Notch). This appears to be the most common of our New England species. It is also, so far as my knowledge extends, the largest and most coriaceous form of the genus. It seems to vary in the color of the upper surface; some plants being olive-brown of different degrees, and glabrous, and others of a very light ash-color, and pulverulent. These differences are sometimes strongly marked, but I have not noticed any other. Plants in the state of fructification seem to be rare, but I found them abundantly at the White Mountain station.

6. G. *Pennsylvànica*, Ach. Syn. (cit. Hals.), Muhl., Hals. Umbilicària Pennsylvànica, Hoffm. (cit. Ach.). Lecídea Pennsylvánica, Ach. Meth. Rocks; on the

Lynn Hills, and in the Notch of the White Mountains. Acharius says in the Supplement to the Methodus, that he has received from Swartz, Siberian specimens of this Lichen.

CETRARIA *juniperina*, Ach. β, pinástri, Ach. Syn., Schær.! Hook., Lichen pinástri, Scop., Dicks., E. Bot. t. 2111. On the small branches of dwarf firs in the Alpine regions of the White Mountains. Differing considerably from the true C. juniperina in habit, and distinguished by the pulverulent very yellow margins of its crisped lobes.

C. *nivális*, Ach. Meth., Schær.! Hook., Lichen nivális, L., E. Bot. t. 1994, Walt. Fl. Carol.

White Mts., on the lower summits; in company with the two following, but less common. Linnæus gives an interesting account of this lichen in the Fl. Lapp. It seems to have been one of the discoveries of his memorable Lachesis Lapponica.

C. *cucullàta*, Ach., Schær.! β, nipharga, Ach. Meth.

White Mountains; lower summits. The delicate violet hue of the base of the thallus, in all the specimens which I gathered, refers them to the variety of this species above cited. I perceive no other differences, but the base of the thallus in the true C. cucullàta is said by Acharius to be "sanguineo-fusca."

C. *Islándica*, Ach. Meth., Schær.! Hook., Muhl., Torr., Physcia Islándica, Michx. Fl. Bor. Am., Lichen Islándicus, L. On the Lynn hills; summits, sparingly. Lower summits of the White Mountains, very abundant and fine. The fructification of this, and all the abovementioned Cetrariæ, is very rare. Linnæus says, that even in Lapland he could nowhere discover that of C. nivàlis; and in the present species it seems to be equally scarce in England and other temperate countries; though I have selected ample specimens from the imported stock of an apothecary. If any where in New England, we might hope to find it at the White Mountains.

C. *vìridis*, Schwein. in Hals., Port. in Mass. Cat. Abington, Porter, and Cambridge, where it occurs not very uncommonly. I have always found it on old rails, in company with CC. ciliàris and lacunòsa. It seems to form with these species, a very natural group; and so far as these three species are concerned, peculiar, if I mistake not, to America.

Borrera *tenélla*, Ach. Lichenogr. Univ., Schær.! Hook., Hals., Parmelia tenella, Ach. Meth., Spreng., Lichen hìspidus, Hoffm., L. ciliàris, β, Huds. Bark of old elms, Cambridge, not uncommon; and in fruit, not rare. This species was first published as American in Halsey's View. As there remarked, its habit is very much that of a Parmèlia, and in the Methodus it is not grouped with the other species, afterwards separated to constitute Bòrrera.

B. *ciliàris*, Ach. Lichenogr. Univ., Schær.! Hook., Muhl., Torr., Parmèlia ciliàris, Ach. Meth. Cambridge, on trees; rare. The presence of marginal fibres, all more or less black, and very black at the apices of the lobes, together with the white, channelled and somewhat powdery under side, led me at first to refer this lichen to B. leucòmela. From this it differs in the light-green hue of its upper surface, and the presence on the same surface of raised black dots. These last form one of the principal characters of the variety of B. ciliàris, named β, melanostícta in Ach. Meth., and our plant may prove to be this variety. I have little doubt it belongs to B. ciliàris. The original B. leucómela of Ach. Meth. was a West Indian plant; and the lichen so named in Hooker's British Flora, is there said to be considered by Borrer a mere variety of B. ciliàris.

B. *furfuràcea*, Ach. If this be what is intended by "Bórrera purpuràcea, Spreng.", which is made a synonym of Evérnia prunàstri in the Massachusetts Catalogue, it is certainly a mistake.

The Bórrera furfuràcea of Acharius is a species universally received, and distinguished from Evérnia prunàstri, by every botanist whose works I have examined, from the time of Linnæus, who also made of them two species of lichen. There is therefore no doubt that the reference of the Catalogue, without any authority to support it, is erroneous. But I have not as yet been able, (even with the help of authentic foreign specimens of both lichens), to distinguish them as Massachusetts plants. I have gathered frequently what I have taken for both plants, and both are labelled in my collection as found in this vicinity; but there is to me a confusion in regard to them which I cannot dispel.

EVERNIA *vulpìna*, Ach. Syn. (cit. Schær.), Schær.!, Port.! (with a quæry) and Hals.? (with a qu.). Parmèlia vulpìna, Ach. Meth., Lichen vulpìnus, L.

Old rails, fences, &c., common. Plainfield, Porter; Cambridge, Watertown, Brighton, &c. I have not ventured to remove the mark of doubt with which this plant has been referred to E. vulpìna, by American Lichenists, without a careful comparison of the plant from this region, and that from Dr. Porter, with Schærer's original Swiss specimens. Between these and our plant, there appears no other difference but color, which in the Swiss specimens is bright greenish-yellow, and in ours dark green. That this difference is not important, will appear from Acharius, (Meth. p. 267–8,) who characterizes the species as "virescenti-citrino" in his specific description, and in the note says "color apud nos fulvus, virescenti-citrinus, rarius flavescens;" and mentions further, that he had specimens from Swartz "colore vivide citrino."

ALECTORIA *jubàta,* Ach. *β, chalybeifórmis,* Ach. Syn. (cit. Schær.), Schær. !, Hook., A. chalybeifórmis, Muhl., Parmélia jubàta, *β*, chalybeifórmis, Ach. Meth., Lichen chalybeifórmis, L. Cambridge, &c. on old rails. This appears to be the common form of Alectòria on the coast. It is distinguished by its rigid and sub-erect more or less black thallus, the branches of which are commonly beset with white soredia, which Acharius says are rarely found on the true A. jubàta. This last I have only seen in old woods in the interior; as on the sides of the White Mountains, where it occurs in great luxuriance.

CORNICULARIA. I gathered specimens of two alpine Corniculariæ on the lower summits of the White Mountains, resembling considerably two alpine forms of Europe, which they may prove to be; but the specimens are not sufficient to allow me to propose them.

Sphærophoron *corallòides*, Pers., Ach. Meth., Schær.!, Spreng., S. corallòides, α, laxum, Turn. and Borr. in Hook., Lichen globíferus, L.

White Mountains, lower summits; on the ground.

S. *frágile*, Pers., Ach. Meth., Schær.!, Spreng., S. corallòides, β, cæspitòsum, Turn. and Borr. in Hook. Lichen frágilis, L.

White Mountains, with the last.

This beautiful genus is, I believe, new to our United States Flora. There is one other form, growing with these in Europe, which may probably be found at the White Mountains.

Cladonia, Hoffm. In adopting an arrangement for such lichens of this group as were in my herbarium, I found some difficulty in ascertaining which had the best authority. Acharius, after separating the Bœomyces, which in the Methodus he had confounded with the true Cladòniæ, arranged these last as one genus under the name Cenomyce. Latterly, Hooker, following M. Feé, has distinguished those whose type is C. rangiferìna from those whose type is C. pyxidàta, calling the former Cladònia and the latter Scyphòphorus; (the Scyphíphorus of Vent. Tabl. du Regne Veg. 2, 36.) On the other hand, Schærer and Sprengel, admitting but one genus, arrange their species under the *old* name Cladònia, of Hoffinann, which was prior to Acharius's Cenomyce. This appeared most accordant with the canons of the science, and I may be permitted to add, most natural. The apothecia are the same in both of the new genera; and the only differences consist in the general absence of the thallus, and the subulate-branched podetia in the Cladòniæ; and the general presence of a thallus, and podetia more or less inflated and cup-shaped at the apices, in the Scyphòphori. Taking some interest in such investigations, I have taken leave thus to preface the following species.

C. *unciàlis*, Hoffm., Schær. !, Spreng., Hook., Cenomyce unciàlis, Ach. Lichenogr. Univ., Muhl., Michx., Torr., Hals. Omitted in the Mass. Cat., but common in this vicinity. Cambridge, &c.

C. *spinòsa*, C. furcàta, var. recúrva, Hoffm. (cit. Hook.), C. furcàta, β, recúrva, Schær. (cit. Hook.), C. furcàta, γ, spinòsa, Hook. Bœomyces spinòsus, Ach. Meth., Lichen spinòsus, Huds., Lightf. White Mountains, lower summits.

Acharius, Hudson and Lightfoot, have considered this form a distinct species.

C. *subulifòrmis*, Hoffm. (cit. Schær.), Spreng., C. vermiculàris, De Cand., Schær. !, Hook., Cenomyce vermiculàris, Ach. Lichenogr. Univ., Bœomyces vermiculàris, Ach. Meth., Lichen subulifòrmis, Ehrh., L. vermiculàris, Swartz. White Mountains, lower summits. This remarkable and interesting species resembles a bundle of white worms. The comparison has often been made, and the recollection of it enabled me to recognise the species at sight.

———— β, taùrica, C. vermiculàris, β, taùrica, Schær. !, Cenomyce vermiculàris, β, taùrica, Ach. Lichenogr. Univ., Bœomyces vermiculàris, β, taùricus, Ach. Meth. Cladònia taúrica, Hoffm., Lichen taùricus, Wulf. White Mountains, with the last; from which it varies in having more erect, and ventricose podetia.

C. *gràcilis*, Hoffm., Schær. !, Spreng. Scyphòphorus gràcilis, Hook., Cenomyce ecmocyna, α, Ach. Syn.

(cit. Hook.), Bœomyces grácilis, Ach. Meth. Lichen grácilis, L. White mountains; lower summits. I have eighteen species of this genus, all of which were found in New England. It is probable, we have the common forms of Europe; and if so, but a small part of our species have been ascertained.

In concluding this paper, I am bound to ask of those whose learning enables them to see its real value, the consideration due, one who has had little experience in his subject, and none in illustrating it. To the advantages of the University Library, containing in Schærer's work alone a certain guide to the greater part of our species, and to the kind counsel of the distinguished naturalist who fills the librarian's chair, I owe all the assurance I have ventured to shew, and certainly whatever credit that assurance may prove to deserve.

ART. XI.—OBSERVATIONS ON SOME SPECIES OF THE MARINE SHELLS OF MASSACHUSETTS, WITH DESCRIPTIONS OF FIVE NEW SPECIES. By C. B. Adams, A. M.; Prof. of Chem. and Nat. Hist. in Middlebury College, Vt.; member of the Bost. Soc. Nat. History. Read Aug. and Sept. 1838.

In the infancy of Natural History, accurate descriptions justly claim the chief attention of the lovers of nature. Observations on the habits and internal economy are of little use unless referred to some well defined species. Hence the labors of some of the earliest naturalists are of much less value than would have attached to them, had they been more exact in their references to species. But while we are in little danger of undervaluing the importance, or rather the necessity, of specific descriptions, we may forget that this is but a preparatory step to a higher object—an intimate and complete acquaintance with the external and internal economy of the species. The description of characters is but an introduction, an unmeaning ceremony, without farther acquaintance.

Although the following remarks make scarcely any advance towards this object, I have thought that it might be worth the while to offer them. With scarcely an exception, they were suggested by personal observation of species of Mollusca, during occasional visits to the southeastern shores of this State. I have also thrown in some descriptive remarks, which seemed necessary, after comparing the original descriptions of authors with numerous specimens, which were collected on these shores. To Dr. A. A. Gould I have been much indebted for his kind assistance in identifying the species which had been described.

COLUMBELLA.

C. *avăra*, SAY, Journ. Acad. Nat. Sc. II. 230.

This Columbella of Mass. differs, but not specifically, from the description of Say in the Journal of the Academy. The pigment appears only on the living shell. The color beneath it ranges from yellowish brown, through rufous, to a dark reddish brown, maculated with white, the white spots being most distinct upon the costæ. These are from fourteen to sixteen upon the body whorl, rarely eighteen in number.

Length sometimes exceeds .65 inch; breadth .25 inch.

In the young shell the outline differs from that of the old, being carinate upon the body whorl at the termination of the costæ, and suddenly tapering.

This species is common, not abundant, at New Bedford and vicinity, Falmouth, Nantucket, Martha's Vineyard, &c. It is rarely, if ever, found recent, north of Cape Cod. In some salt mud, which had been turned over at East Boston, I found a single specimen, which had become cretaceous.

It is not found living above low-water mark, except when driven up by violent storms.

BUCCINUM.

B. *vibex*. *Nassa vibex*, SAY. Journ. Acad. Nat. Sc. II. 231.

The number of revolving filiform lines upon the body whorl is more frequently nine to ten; as many as three to five teeth upon the inner side of the labrum.

Length .5 inch; breadth .33 inch.

This shell is rare. Say had seen but five individuals when he described the species in the Journal of the Academy. Before publishing the American Conchology, the author had received several specimens from Charleston, S. C. It occurs at New Bedford and vicinity, where I have found four or five specimens. For an additional number I am indebted to P. G. Seabury, Esq. of New Bedford. These specimens are all old, and somewhat cretaceous, but in some of them the rufous bands are very distinctly marked. It has not been found north of Cape Cod.

B. *trivittàtum.* *Nassa trivittata*, Say, Journ. Ac. Nat. Sc. II. 231.

At New Bedford fair specimens of this shell are not abundant. , After a violent storm, however, I have found them living. At Nantucket this species is abundant. Last May, being upon the inner side of Brant point, I found great numbers a few rods east of the ship yard, but a little below high-water mark, burrowing in the clean siliceous sand. Furrows, several feet long, of the width of the shell, had been made by the crawling of the animal. In the act of burrowing, the base of the shell was downward, but when the animal was at repose in his burrow, the position was completely inverted.

On the south shore of Nantucket, I have found them of a larger size, but not living and not abundant.

Say's description applies well to the shells from these localities, except that of the three lines of rufous color upon the body whorl, that next the suture is darker. The shade of the lower line or band deepens next the outer margin. It should be added, that the two upper bands of rufous color are double, being upon each side of one of the revolving impressed lines, and that the lower one is sometimes triple. But these bands are often nearly or quite obsolete, or confluent upon the entire surface, in the specimens from Brant point. The live shell from this locality, although in clean sand, is covered with a dirty cinereous pigment.

Length of one of the live shells from Brant point .65 inch ; breadth .35 inch ; length of a dead shell from the south shore of Nantucket .85 inch ; breadth .40 of an inch.

This species is occasionally found living in the vicinity of Boston, and worn specimens are abundant at Chelsea beach. The specimens in this vicinity, whether living or dead, are usually destitute of the bands of rufous color, which suggested the specific name, but the whole surface is often more or less tinged with it, and more deeply upon the granules, which are formed by the strong decussation.

The *operculum* is horny, lamellar, subtriangular, and irregularly serrate upon the two outer margins. The *foot*, as in the B. *obsolètum*, is very long.

B. *lunàtum*. *Nassa lunàta*, Say. Journ. Acad. Nat. Sc. V. 213.

The coloring of this species, as Say remarks, varies much in different individuals. Some are of a uniform, very deep brownish red, and others are of a paler shade of the same color. But the arrangement of colors described in the Journal of the Academy is a type of which most of the varieties are modifications. The sublunate whitish spots are often so much enlarged as to constitute the ground color of the shell, being separated only by narrow, undulate longitudinal lines of brown, while the revolving stripes of brown which usually separate them into two or three series, are wanting. Many specimens are intermediate between this arrangement and that which Say has taken for the type of the species.

A single specimen of a variety remarkable for the elongation of the spire, occurred among several hundred others. Unfortunately it has been lost, and a particular description cannot be given.

This species appears to be, with scarcely an exception, associated with *Cerithium reticulàtum*, Totten, but is much less abundant. In the spring they are found upon the surface of the sand. Their station, however, is a few feet below low-water mark, where they are found clinging to sea weed, stones, other shells, &c. Their movements are very lively, agreeably to a remark of Quoy upon the species in general of this division (Nassa) of Buccins. I have found them at Nantucket within the harbor, in the harbor of New Bedford, and in that of Dartmouth. Dr. A. A. Gould has found them as far north as Provincetown, and a single specimen has been found at Chelsea beach. Say found the species in the southern States.

B. *obsolètum*. *Nassa obsolèta*, Say. Journ. Ac. Nat. Sc. II. 232. *Búccinum olivifórme*. Kiener, Iconog.

The cancellate and granulated appearance, mentioned both by Say and by Kiener, is not a constant character, except in the young shell. On the full grown shell it is frequently more or less distinct on the upper part of the spire, but becomes obsolete upon the larger whorls. Dr. Storer remarks (Translation of Kiener's Iconog. p. 68) that "the tranverse striæ are constant, but the longitudinal striæ are usually wanting, and are often replaced by folds running the whole length of the shell, resembling in this respect B. *undàtum*." The white band, upon the inner side of the labrum, just above the middle, is usually well defined; the inner surface of the labrum is purplish black near the margin, and purplish white more interiorly. In a specimen from Florida, the white band is not distinct from the purplish white surface, also in a few from Nantucket and in many from New Bedford.

Length one inch ; breadth .55 inch.

This species inhabits not only our estuaries, but our ocean shores. It seems, however, to prefer situations where it is not exposed to the surf of the open sea. The finest specimens which I have seen, were growing at Nantucket, where they are as abundant as in any of our harbors on the continent. Kiener, who describes the species from the young, under the name of B. *olivifórme*, observes that his specimens were sent from New York, habitat unknown ; but from the appearance of the shell, which is usually carious upon the upper whorls, presumes that it inhabits fresh water. Any one who sees the shell is not surprised at this conjecture. Indeed it does grow in places where there is some admixture of fresh water, at the margins of our marshes ; but this is so far from being essential, that, as already remarked, its fullest development is in situations where no fresh water is present.

No species, of equal size, is so abundant on our shores.

In Boston harbor I have observed that, in winter, these animals collect together in heaps, filling up slight depressions on the flats, but disperse during warm weather.

The *operculum* is horny, lamellar, subelliptical, small.

PURPURA.

P. *lapillus*. LAM., An. sans Vert. *Búccinum lapillus*, LINN.

This species, which, with its numerous varieties, is accurately described and figured by Kiener, was found on the rocks at Martha's Vineyard by Mr. Seabury. I have not seen it at Nantucket or at New Bedford, but have found the ***Fusus cinèreus*** in situations, where I should expect to see this species. I have also looked for it without success upon the rocks at Wood's Hole, in Falmouth.

RANELLA.

R. *caudàta*. SAY, Journ. Ac. Nat. Sc. II. 236.

This species, as it occurs on our shores, is very accurately described by Say. The canal, however, is not longer than the spire, but is of equal or less length. This shell is not found north of Cape Cod, and but rarely at New Bedford, where I have found but three or four specimens, very old and worn. At Nantucket I have found but a single worn specimen. Say remarks, however, (but his observations did not embrace New England,) that this species is rather common. For a considerable number of specimens I am indebted to Mr. Seabury.

PYRULA.

P. *canaliculàta*. LAM., An. sans Vert. *Murex canaliculàta*. LINN.

P. *càrica*. LAM., An. sans Vert. *Murex càrica*. GMEL.

Both of these species are found upon the southeastern shores of this State, but I am not aware that they have been found north of Cape Cod. The P. *canaliculàta* is more common than the P. *carica.* At Nantucket both species are more common than at New Bedford. In Rhode Island they are said to be abundant. At Nantucket I have found two or three individuals, living on a muddy bottom below low-water mark. William H. Taylor, Esq. of New Bedford, recently showed me a number of specimens, which had been taken in the pots set for lobsters.

In the P. *canaliculàta*, the crenulations, which Lamarck notices upon the carination of the whorls, are often obsolete in the older specimens, in consequence of a decay of the external surface of the shell during the life of the animal. The labrum is broadly covered with a thin coat of polish, the outer limit of which is abruptly defined. The color is pale cinereous, brown, or whitish. The color of the fauces varies from chocolate brown to brownish yellow. Sometimes the inner margin of the labrum is whitish. A specimen in my cabinet is 7 inches long and 4 inches broad, a common size.

The epidermis is strongly hirsute upon the upper whorls and upper portion of the body whorl, and becomes less hirsute in receding from the carination down to the cauda. The hairs, which are quite sharp and stiff, are arranged upon fine longitudinal elevated striæ, at distances which are regularly measured by transverse striæ. These hirsute lines, viewed transversely to the axis of the shell, are often alternately larger and smaller. They are more distinct longitudinally, and the longitudinal striæ are also more conspicuous on the epidermis, but the transverse striæ are more so upon the shell. The epidermis is usually worn off from the upper part of the spire.

The *operculum* is horny, lamellar, elliptical ; the striæ of growth very large ; stages of growth very evident ; the older portion sometimes appearing to be merely glued upon the upper extremity and outer surface of a new operculum ; around the margins of the surface of attachment, it is covered with a shining, wax-colored deposit.

In the P. *cárica* the revolving series of tubercles marks the periodical stages of growth, which do not appear in the P. *canaliculàta*. From each tubercle downward, a former labrum, although not reflected, is conspicuous on specimens whose surface has not been eroded.

In my cabinet is a specimen, which may be regarded as a well marked variety. In the progress of growth, each successive whorl is usually placed upon the preceding as high up as the series of tubercles, so that, as Lamarck observes, the tubercles on the upper whorls are at their base. But in this individual, which was found last year, living, in the harbor of Nantucket, the successive whorls are applied below the tubercles, at a distance which increases in receding from the apex, and which measures one third of an inch at the labrum. The columella also is less arcuate, and the cauda straighter than in the common P. *cárica*, and the aperture is less. The colors are also unusual. The lower portion of the columella, and upper and lower inner surface of the labrum, are white ; the middle of the labrum is tinged, not very deeply, with a dull red purple. The inner surface of the labrum of the penultimate stage of growth is yellowish brown, irregularly tinged with deep brown. On and near the labrum, the labra of former stages of growth are very conspicuous, and are colored with a deep dull reddish or brownish purple. At the upper part of the labrum and within the aperture, is a narrow, acute white fold, sub-oblique, the outer extremity of which spreads into a white callus. In the common variety of P. *cárica*, there is at this place a very obtuse prominence, of uniform color with the other parts of the fauces. This specimen is rather immature. In length it is five and a half inches, and in breadth less than three. Is this shell a distinct species ?

The operculum of the P. *cárica* is much like that of the P. *canaliculàta*. A specimen of this shell, of a common size, is seven and one-third by four and one-third inches.

FUSUS.

F. *cinèreus*, SAY. Journ. Ac. Nat. Sc. II, 236.

This shell, as described by Say, is usually reddish brown beneath a cinéreous epidermis, which is eroded on the ribs, and the aperture within is of a deep chocolate color. But not unfrequently the fauces are white, or white with a very slight tinge of the chocolate color inclining to red, or yellowish brown near the margin, and deep chocolate more interiorly. A specimen in my cabinet has two bands of purplish red upon the fauces, and the upper and lower parts of the columella are of the same color. The transverse costæ are often nearly obsolete. The longitudinal ribs sometimes swell into undations; or they are wanting upon a portion of the surface. They are usually ten or twelve in number.

Length 1,25 inch.; breadth .60 of an inch.

Last fall, I found this species in considerable numbers, clinging to the wet sides of the rocks, at and near low water mark. In their station they resemble the *Púrpura lapillus*, but their habitat, unlike that of the P. *lapillus*, is confined to bays. This year I have not thus far (July) succeeded in finding them in this situation, but found a few near low water mark, upon a gravel bottom.*

This shell is found in Boston harbor, but is not very common here.

The *operculum* is horny, lamellar, sub-triangular, broader above than below.

CERITHIUM.

C. *reticulàtum*, TOTTEN, Am. Jour. Sc. XXVIII, 352.
Pasitheä nigra, " " " " XXVI, 369.

This species was first described by Col. Totten, from numerous immature specimens, and doubtfully referred to Lea's genus *Pasitheä*. Not only the characters, but the immense numbers, of the young, which are often found without a solitary mature specimen, rendered them liable to be mistaken, on first acquaintance with the species, for the full grown shell. A very accurate description, by the same writer, from mature specimens, was afterwards published.

The mature shell differs from the young, not only in the presence of a well marked canal, but in the labrum, which is always highly arched, and is produced beyond the plane of the aperture,—in the length of the spire,—in the longitudinal ribs, which are usually less distinct on the body whorl,—and in the color, which, in the young, is a uniform reddish black, and which becomes reddish cinereous in weather-worn specimens; while in the mature shell the depth of color diminishes from the upper whorls, often passing into a pale horn color, sometimes white, on the lower whorls, regularly maculated on the revolving ribs with rufous or brownish.

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* During the last week, I have found numbers upon the rocks in the harbors of Dartmouth and Fairhaven, in the same situation as at a similar period of last year.

Length, .28 in.; breadth, .11 in.; of a specimen, rather more elongated than usual, length .23 in.; breadth, .085 in.

The *operculum* is horny, ovate, concave externally, but with an irregular surface, multispiral; apex in the centre of the broader part; whorls four to five, very convex on the under side. The operculum is small, and drawn far within the shell. Length, .05 in.; breadth, .04 in.

This species is very abundant at Nantucket, New Bedford, and vicinity, and has been found by Dr. Gould as far north as Provincetown harbor, on Cape Cod. In the description of the species, Boston harbor is mentioned as a locality. I have not been able to find it, and am not aware that the frequent and very careful search, which has been made for the marine shells in our neighborhood within two or three years past, has detected it. Probably Cape Cod is the limit, to the north of which it will rarely be found.

In the spring, the young of this species are often found lying on the shore in such numbers as to conceal the sand beneath them, although few, if any, are mature.

A violent storm disperses and buries them in the sand, and they should be sought after moderate weather. They are more frequently found where a small lagoon has an outlet on a sandy shore. But this is not their proper station, and specimens thus obtained are more or less cinereous and weather-worn. They are found living, not far above, and more frequently below, low water mark, on sea-weed, larger shells, stones, and other marine bodies. Full grown individuals are rarely seen in any considerable number above high water mark. This summer I found however, in Dartmouth harbor, a large number, with but few of the young, left by the tide on the sand; but this is unusual. In the same harbor the young were found clinging, in great profusion, to the culms and slender filaments of various species of algæ, where the water was from one to three feet deep at the time of low tide. By rinsing a few handfulls of the sea-weed in a bucket of water, great numbers were obtained.

It is worthy of remark that the four species of this genus, which are found on the southeastern shores of Massachusetts, are scarcely distinguishable in respect to color, which, in all of them, with the exception of the body whorl in the C. *reticulatum*, is reddish black, and becomes reddish cinereous on exposure to the weather.

TURRITELLA.

T. *interrupta*, TOTTEN, Am. Journ. Sc. XXVIII, 352.

This species was first obtained by Col. Totten, with a dredge, in Newport harbor, Rhode Island. This summer with a dredge I found a number of specimens in the harbor of Dartmouth, in mud, where the water exceeded the depth of four feet at low tide. The majority of specimens thus obtained were dead, and had become cretaceous, but a number of them were living, and were readily identified with the description of this species. The number of " transverse ribs," (transverse not to the axis of the shell but to the whorls,) is seldom less than twenty-five, and often exceeds thirty. Above the body whorl, the number of the revolving lines does not exceed eight. The arrangement of them in pairs does not distinctly appear in these specimens. There are three revolving bands of color on a whitish horn colored ground, the upper of which is a reddish violet, and the others are wax colored; but the wax colored bands are often confluent into each other, sometimes over the entire surface of the whorls.

Length of the largest specimen, .295 in.; breadth, .075.

This species has not before been noticed in the waters of this State.

CREPIDULA.

C. *plana*, SAY. Journ. Acad. Nat. Sc. II. 226. Amer. Conch. No. V. Pl. 44.

Say's description of this species corresponds with great exactness to the specimens which are found in the waters of this State. The diaphragm, however, is always less than one half, and is usually two fifths of the length of the shell. The young shell is not only orbicular but convex, gradually losing its convexity, but not always becoming more elongated, as it increases in size. The color is a uniform white, both within and without, the outer surface of the old shell losing the purity of its color from exposure.

The largest individual, which I have, is 1½ in. in length, and one inch in breadth.

This species appears to be always parasitic. The shells of the *Pyrula canaliculàta*, and *Pyrula càrica*, Lam. are often covered externally with the C. *fornicàta*, Say, and upon the fauces of the aperture with both the C. *fornicàta* and the C. *plana*, while the interior is occupied by a hermit crab. The *Nàtica duplicàta*, Say, and the valves of the *Pecten concèntricus*, Say, are often found loaded with these species in the same manner. Some of the finest specimens, which I have found, were upon the inner surface of the crust of the *Lìmulus polyphèmus*, Linn., (Horse Shoe, or King Crab) in company with the C. *fornicàta*, while the latter held exclusive possession of the outer surface.

This species cannot, (the question has been raised) be the C. *fornicàta*, blanched by seclusion from the light, for although it is never found on the outer surface of shells, it is accompanied on the inner surface by the C. *fornicàta*, which here retains its colors.* The latter is also very obviously distinguished, except from the young of the former, by its convexity, and by its margin, which is in a uniform curve with the disc of the shell, instead of being abruptly deflected as in the C. *plana*.

Say observes that this species is common on the coast of the United States from Florida to New York. It is common at Nantucket, but is rarely found at New Bedford. In the harbor of the latter place, under a depth of three feet water at the time of low tide, I found a valve of the *Pecten concéntricus*, loaded with *Serpulæ* and the *Vérmetus lumbricàlis*, on the inner surface of which was an immature specimen. It occurs rarely at Chelsea beach, where I once found a single specimen without the animal, in the sand.

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* A large specimen in my cabinet supports on its own outer surface several individuals of the C. *fornicàta*.

C. *fornicàta*, Lam. Anim. sans Vert. in loc. *Patélla fornicàta*, Linn. Syst. Nat.; De Roissy, Buff. Moll. V. 238. *Crepídula fornicàta?* var. Say, Journ. Acad. Nat. Sc. II. 225.

The large species of Crepídula, which grows on our shores, was described as a variety of the C. *fornicàta* by Say, who remarks that it may probably be distinct, as it seems to differ from the species as described by Roissy, in having literal lineations instead of spots. Without attempting to decide upon the identity of the species, it may be remarked that the rufous lines are often interrupted and irregular, presenting the appearance of spots rather than of lines. The prevailing system of coloring, however, is of waving rufous or chestnut colored lines, on a ground of white, which is tinged more or less with the same or with a dingy blue; sometimes the surface is of a uniform chestnut color. The diaphragm is a pure porcelain white. The interior is of a chestnut color, sometimes uniform, more frequently in large irregular spots, with white. The convexity varies remarkably. In some individuals it exceeds the breadth, and in others is scarcely equal to one third of it.

A large specimen in my cabinet is 2.18 in. in length, and 1.37 in. in breadth.

In the young shell the outline is more orbicular, the apex usually distinct from the margin of the aperture, and the internal colors penetrating to the outer surface.

This species is always found growing on shells or other marine bodies. On the south shore of Nantucket it is common on the crust of the *Límulus polyphémus*, (Horse-shoe). Several individuals are often found growing upon each other in an imbricate manner. The margin of the aperture is adapted to the surface on which it grows. Hence the margins of individuals, which grow on the valves of a *Pecten* are scalloped. A valve of the P. *concéntricus* is in my cabinet, on which are two specimens, the apex of one of which is near the basal margin of the valve, and the position of the other is exactly the reverse, in consequence of which the apicial margin of the one and the opposite margin of the other are conformably pectinated, the ribs of the Pecten being much more prominent on the basal half. Another specimen has quite prominent ribs, like the Pecten, abruptly commencing at one fourth of the distance from the apex, and extending over the remaining three fourths to the margin, which is scalloped.

This species is very numerous at Nantucket, but is not often found living above low-water mark. It occurs at New Bedford, where a vast quantity of the dead shells cover a part of the margin of a small island to the depth of a foot. This species occurs also at Chelsea beach.

C. *convéxa*, SAY. Journ. Acad. Nat. Sc. II. p. 227.

This species, which is easily distinguished from the C. *fornicàta*, is very accurately described by Say. The apex does not, however, usually extend lower than the margin of the aperture. The color is a uniform deep chestnut brown.

This shell is rare on the southeastern shores of this State, but is there of a larger size than in this harbor and vicinity. The largest, which I have found, is .55 in. in length, and .37 in breadth. The largest of many hundred specimens from this vicinity is .42 in. by .28 in. The species probably does not occur, or but very rarely, at Nantucket.

In the summer of 1836, this shell was abundant at Chelsea beach, living on fragments of eel grass (*Zóstera marina*), between high and low-water mark. Since then, comparatively few have been found there. Last August, I found them very abundant in this city, on the north side of the Winnisimet ferry landing, on a large quantity of eel grass, which was floating among the timbers below low-water mark. They adhered closely, and under many of them, attached to the sea weed, were ten or twelve small bright yellow ova, enveloped in a transparent jelly.

JAMINIA SEMINUDA.

Plate IV., fig. 6.[*] 13.

J. testâ parvulâ, acuto-conicâ, nitidâ, albidâ, sub-translucidâ; anfractibus septem, convexis, decussatim granulosis; anfractu postremo infra striato; aperturâ ellipticâ, basi effusâ; columellâ reflexâ, uniplicatâ.

DESCRIPTION. *Shell*, acute-conic, glossy white, diaphanous; *whorls*, about seven, convex; upper whorls l upper half of the body whorl, rugose longitudinally, h three impressed revolving lines, presenting a de- sate or granulous appearance; upon the lower half of the body whorl are four additional impressed revolving lines, one of which runs around at the inferior abrupt termination of the rugæ, which are eighteen to twenty; *suture* broad, divided by an indistinct spiral ridge; *apex* acute; *aperture* elliptical, one third the length of the shell; *labrum* not thickened, pectinated by the revolving lines, which are distinctly seen upon the inner side; inferior margin effuse; *columella* with a single sub-oblique fold, arcuate, reflexed; operculum?

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[*] For the figures of this and the following species I am indebted to the kindness and skill of my friend, Dr. Gould.

Length, .15 inch; breadth, .07 inch.

Inhabits Dartmouth harbor.

Cabinets of the Boston Society of Natural History, of William H. Taylor, Esq. of New Bedford, and my own.

Remarks. Of this species I found four specimens only, which are all that I have seen. They were found in Dartmouth, at the village of Ponygansett, four miles southwest from New Bedford. They were about five feet, perpendicular depth, below low water mark, upon single valves of the *Pecten concéntricus*, Say, in company with the *Nassa lunàta*, Say, *Columbélla avàra*, Say, and the *Nùcula margaritàcea*, Lam. The valves of the Pecten, on which they were found, were taken from the bottom by my hands at a venture, when bathing. A dredge would probably reveal more.

This species probably belongs to Brown's genus Jaminia, which is nearly allied to his Pyramis, but as descriptions of these genera are not accessible, it is with some doubt that I have referred it to Jaminia. It undoubtedly belongs to the same genus with the *Actæon* *trifidus*, Totten, (Am. Journ. Sc. XXVI, 368,) but this generic name is appropriated to a genus of naked Mollusca.

In size and form this shell resembles the A. *trifidus*, but differs from it in the convex whorls, granulous surface, and revolving lines which are all very distinct and less numerous, while in the A. *trifidus* two or three only are distinct, and the others are nearly obsolete,—in the aperture, which is not angular superiorly, and is more effuse and less rounded inferiorly. It is more nearly allied to *Turbo spiràlis*, Montague, Test. Brit. p. 323, but differs in the number of volutions and in the presence of the revolving lines around the rugose surface. In the figure the *Turbo spiràlis* is broader in the middle of its length, but this species is broader below the middle; the aperture is also shorter.

I take pleasure in affixing the specific name suggested by Dr. Gould.

PYRAMIS FUSCA.

Plate IV., fig. 9.

P. testâ parvulâ, conicâ, decisâ; epidermide fuscâ, nitidâ; anfractibus sex, convexis; suturâ impressâ, sub-duplicatâ; aperturâ ovali, suprâ angulatâ, infrâ rotundatâ; labro tenui; columellâ convexâ, reflexâ, haud plicatâ.

Description. *Shell* conical, rather elongate, subperforate; *spire* truncated; *epidermis* brown, shining, not membranous, not separable from the shell; *whorls* about six, not reckoning those which are lost at the apex, with minute striæ of growth; *suture* strongly impressed, often double; sometimes with a revolving line at the upper side of the whorl; aperture about two-fifths the length of the shell, parallel to the axis, oval, angular superiorly, rounded inferiorly; *labrum* not thickened; *body whorl* entering the aperture in the upper of the left side, and separating the margins; *columella* emerging at the middle of the labrum, convex, reflected, smooth, without any fold; operculum?

Length, .15 inch; breadth, .07 inch.

Inhabits the harbors of New Bedford and vicinity.

Cabinets of the Boston Society of Natural History, of A. A. Gould, M. D., George B. Emerson, Esq., and my own.

Remarks. This shell was found after my return from New Bedford, among a large number of the *Turbo obligàtus*, and *Actæon trifidus*, which were brushed into a box from wet planks, to which they were clinging, not far above low water mark. Six specimens were thus found; also four more with the A. *trifidus* in a parcel of sand from the harbor of New Bedford. Since then I have found a single specimen by dredging a few feet below low water mark in Dartmouth harbor. The middle of the body whorl and the lower part of the upper whorls were brown, but the rest was whitish. I have also received several specimens from P. G. Seabury, Esq. who found them at Tiverton, R. I., in company with the *Turbo minutus*, Totten, in the sand.

It resembles the *Jamina exigua*, Couthouy, Bost. Journ. Nat. Hist. II. 92, in several important characters, but differs in others. The epidermis is dark brown, close, and shining; that of the J. *exigua* is very pale, nearly white, membranous and loose, and dull; the body whorl in our shell is much less ventricose and more cylindrical; incremental striæ plainly visible on the epidermis; aperture less; no fold on the columella. It approaches nearly to the *Turitélla bisuturàlis*, Say, which, however, is pellucid, with five whorls, suture not deeply impressed, is more elongate, and whorls flattened.

This species may perhaps be referred to Brown's genus Pyramis. Specimens with a revolving line on the upper side of the whorls, may be regarded as a well marked variety.

CERITHIUM EMERSONII.

Plate IV., fig. 10.

C. testâ parvâ, conicâ, elongatâ, longitudinaliter rugosâ, lineis granulatis cinctâ; anfractibus septemdecim, planulatis; apice acutâ; suturâ sub-impressâ, amplâ; aperturâ sub-quadratâ; labro pectinato; columellâ in spiram ductâ; caudâ recurvatâ.

DESCRIPTION. *Shell* conical, elongate, with a regularly granulated surface, dark reddish brown; *whorls*, sixteen to seventeen, flattened, with two revolving series of prominent granules at the upper and lower margins, and a middle series, nearer to the upper than to the lower one, and less prominent, commencing between the fourth and eighth whorl from the base, and becoming more distinct as it approaches the base; in each series the granules are connected by a rather narrow but very elevated revolving line, which rises nearly as high as the granules, so that in worn specimens the appearance is of a continuous line moderately dilating into granules; the latter are also connected by wrinkles extending across each whorl; upper side of the whorls with an acute edged carina; *apex* acute; *suture* deeply impressed, broad; *body whorl* abruptly terminating with a granulous carina; *aperture* sub-rhombic, nearly square, about one sixth the length of the aperture; *labrum* pectinated by the revolving granulous lines; *columella* spirally twisted; *canal* less than half the length of the aperture, recurved.

Length, .45 inch; breadth, .12 inch.

This is the common size; one specimen, however, is about six tenths of an inch in length.

Inhabits New Bedford harbor on the Fairhaven side, and Nantucket ?.

Cabinets of the Boston Society of Natural History, of Geo. B. Emerson, Esq., of A. A. Gould, M. D., P. G. Seabury, Esq., of New Bedford, and my own.

Var. α. Granules obsolete, with simple, broad, elevated, revolving lines, the middle one on several of the lower whorls as prominent as the outer ones.

Cabinet of William H. Taylor, Esq. of New Bedford, and my own.

REMARKS. This shell was first presented to me in Nantucket, as a native of the island, and a number of individuals were afterwards given to me by Pardon G. Seabury, Esq. of New Bedford, who found them at Fairhaven. From these specimens, the species and variety were described at a meeting of the Society in August last. Since then I have seen an individual of the variety, which was found on an island in the harbor of New Bedford. At Fairhaven, I hȧve found several specimens, (none of them living, though some of them were quite fresh,) which had been thrown upon the beach with the *Cerithium reticulàtum*, Totten. Their station is yet to be ascertained, but is probably below low-water mark.

I take pleasure in offering this humble tribute of respect to George B. Emerson, Esq., President of this Society.

CERITHIUM NIGROCINCTUM.

Plate IV., fig. 11.

C. testâ parvulâ, conico-cylindracâ, granulosâ, nigro-rubrâ; anfractibus tredecim, sinistrorsum volventibus; spirâ elongatâ, acutâ; suturâ subduplicatâ; aperturâ subellipticâ, parvâ; caudâ recurvatâ.

DESCRIPTION. *Shell* blackish red, conic-cylindrical, with three revolving series of granules; the middle series equally distant from the others, and, on the whorls of the lower half of the shell, of equal size, but diminishing above, and wanting on the upper fifth; the upper row is less than the lower one on the whorls of the upper fourth or fifth part of the shell, and is wanting upon several of the first whorls; the lower series is also wanting upon the extreme apicial whorls, but, in descending from the apex, appears before the others; the granules are formed by the revolution of two impressed lines across numerous longitudinal ribs or rugæ; *spire* elongate, very acute; *whorls* about thirteen; *suture* rather broad, impressed, divided by a revolving somewhat granulous black ridge, which in the progress of growth gradually changes its situation, and forms the lower side of the last whorls, and another similar revolving ridge appears in its place; an impressed line upon each side of the sutural ridge, and two others emergent from the aperture, are continued around the lower half of the last whorl; *aperture* subelliptical, less than one-fifth the length of the shell; *labrum* deeply concave; *columella* prominent below, black; *labium* regularly arched, surpassing the labrum, notched by the revolving impressed lines; *canal* recurved, about one third as long as the aperture.

Length, .3 inch; breadth, .08 inch.

Inhabits Dartmouth harbor, and is found clinging to sea-weed a few feet below low water mark, associated with the *Cerithium reticulàtum,* Totten, and *Buccinum lunàtum,* Say.

Cabinet of the Boston Society of Natural History, of Dr. A. A. Gould, of Prof. Hitchcock, and my own.

REMARKS. July 5th, of the present year, I found an immature specimen of this species in the harbor of Dartmouth, and at a subsequent visit to the same locality, obtained about two dozen specimens in various stages of growth.

This species is easily distinguished from the *Cerìthium reticulàtum,* not only by the obvious character of heterostrophy, but by others more important, and too evident to require remark. It is more nearly allied to the C. *pervèrsum,* Lam., from which it differs in the black sutural ridge, and in the middle series of granules, which in the C. *pervèrsum* is nearer to the upper than to the lower series. It differs from the *Murex adversus* of Montague and Turton, (*Cerìthium advèrsum,* Brown,) in having the canal recurved, the whorls very distinctly defined by the impressed suture, and in the color, which, in the *Cerìthium advèrsum,* is opaque light brown ; the figure by Brown differs also in other respects from our shell.

CERITHIUM GREENII.

Plate IV. fig. 12.

C. testâ nigro-rubrâ, infrà cylindracâ, suprà tereti, rugosâ ; spirâ elongatâ ; anfractibus duodecim ; apice lævi, acutâ ; suturâ sub-duplicatâ ; aperturâ ovali, parvâ ; columellâ subspirali ; caudâ perbrevi.

DESCRIPTION. *Shell* blackish red, cylindrical in the lower half, tapering above, thickly and deeply rugose with three revolving elevated lines, swelling upon the rugæ into granules; the lower series of granules rather larger, and the upper one less than the middle series; the upper series nearer to the middle one, and obsolete on the upper whorls; the lower series appearing first in the progress of growth; *spire* elongate; *whorls* about twelve; apicial ones smooth, nearly white and pearly; *suture* rather broad, impressed, divided by a revolving black ridge, which is obsolete between the upper whorls, and is prolonged around the body whorl, with two other black ridges emergent from the aperture; *aperture* oval, nearly as broad as long, scarcely more than one sixth the length of the shell; *columella* rather prominent below, subspiral; *labrum* obtusely notched by the revolving lines; *canal* very short, not more than one sixth of the length of the aperture, slightly recurved.

Length about .18 inch; breadth .05 inch.

Inhabits Dartmouth harbor, and was found clinging to marine plants, a few feet below low-water mark, in company with the *Cerithium reticulatum,* Totten, and *Cerithium nigrocinctum,* Nob.

Cabinet of the Boston Society of Natural History, and my own.

Remarks. Aug. 29th of the present year I obtained this species in the harbor of Dartmouth. The sea-weed was rinsed in a bucket of water, by which process a great number of the C. *reticulàtum* were washed off, among which were found several specimens of this species and of the C. *nigrocinctum.*

I take pleasure in dedicating this species to Thomas A. Greene, Esq. of New Bedford.

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ART. XII.—A REPORT ON THE FISHES OF MASSACHUSETTS. By D. HUMPHREYS STORER, M. D.

INTRODUCTION.

WERE the pages of our Journal read only by the immediate members of the Society, by whose patronage it is supported, I should consider it superfluous to preface the following Report with a single remark. But as many, both at home and abroad, take a lively interest in our publication, and rely with confidence upon the communications therein contained, I feel it a duty I owe myself, to state in a few words, the circumstances under which my Report, necessarily imperfect, has been written.

In June, 1837, I received, with several other gentlemen, an appointment as Commissioner to prosecute the Zoological Survey of the State. So trifling were these tasks considered,—so much was supposed to have been already done by the gentlemen who had furnished the previous catalogues, that the Commissioners were expected to perform their respective duties in a single season. To prepare a catalogue of our Fishes in a single year, I felt was impossible, but, at the same time, was willing and ready to do all in my power towards the accomplishment of so desirable an object. I at once commenced my labors, by writing to all parts of the State from whence I could hope for the slightest aid, and by engaging upon the spot the services of intelligent fishermen. I had thus labored for months, almost despairing of accomplishing any thing satisfactorily, when, in the latter part of that year, it was intimated that another season would probably be allowed the Commissioners for a continuance of their investigations. Having found the previous catalogue, upon examination, so exceedingly erroneous and defective that no reliance could be placed on it, and consequently that no reference could be made to the fishes therein contained, I at once determined to attempt the formation of another, entirely independent of it. To make a catalogue, however, without at the same time furnishing some characters by which species could be recognised, would be presenting a mere list of names, perfectly useless. I had then no alternative left me but to collect and minutely describe every individual species. Many of the species described by Mitchell, in his "*Fishes of New York*," and by Le Sueur, in his various papers, inhabit our waters; but as the *history* of the former is contained in the volume of a Society's Transactions, which is very difficult to obtain,—and the *contributions* of the latter are distributed through the pages of scientific journals equally inaccessible to the general reader, I have described anew, without regarding the previous accounts, every species which has fallen under my observation. Since December, 1837, but a little more than a year, all the descriptions have been written. Could I have known, at first, that two seasons would have been allowed me for the prosecution of my labor, better specimens might, in many instances, have been procured for description, and the hurried manner, in which several of the descriptions have been necessarily written, would have been avoided.

Want of sufficient time, then, is my only excuse for not having done what time alone could accomplish. Without the assistance of kind and attentive correspondents and friends, I could have done literally *nothing.* Constantly confined by professional avocations, I have depended entirely upon others to collect and preserve the materials, endeavoring myself only to distinguish, arrange and describe them.

The small number of new species here presented may excite surprise. Disgusted with the mania so common among naturalists to form species out of mere varieties, thus casting confusion upon their favorite pursuits, and bringing odium upon themselves, I have endeavored to avoid this error, and may have carried the feeling so far, that some of the species, catalogued here as having been previously known, may, at a future period, be considered new. If, in this respect, I have erred, my descriptions will in themselves correct me.

Inasmuch as unavoidable errors, of greater or less importance, may be detected by the scientific critic in this report, I trust it will be remembered, that in *its preparation* I have been entirely unaided. Not knowing a single ichthyologist in New England, to whom, in cases of doubt, I could refer for advice and instruction, I have been compelled to rely wholly upon myself.

For the plates which accompany this paper, I am indebted to the skill and kindness of my friend Jeffries Wyman, M. D. It may be thought singular that I have figured these species to the exclusion of other previously undescribed fishes. Since the commencement of my labors, I have ever desired that *all* species should be illustrated by plates; but until within a very short period, I had the impression that the Reports of the Commissioners were not to be accompanied by figures; and this error was not removed until several opportunities of drawing rare species were lost.

Two of the species here figured are new to science. A third, the "*Lamna punctata*," has never been figured. The "*Aspidophoroides monopterygius*" is figured on account of its rarity. I have never met with a good plate of the "*Orthagoriscus mola*."

In my classification, I have followed the arrangement of Cuvier, as established in the "*Regne Animal*."

The *generic characters* are generally given in the language of Yarrell.

ORDER I.

ACANTHOPTERYGII.

FAMILY I.

PERCOIDES.

PERCA. CUV.

Generic characters. *Two dorsal fins, distinct, separated; the rays of the first, spinous; those of the second, flexible: tongue smooth: teeth in both jaws, in front of the vomer, and on the palatine bones: preoperculum notched below, serrated on the posterior edge: operculum bony, ending in a flattened point directed backwards: branchiostegous rays 7: scales rough, hard, and not easily detached.*

P. *flavescens*. Mitchell. *The Common Perch.*

Trans. of the Literary and Philosoph. Society of N. Y. i. 421.
Cuv. et Valenc. Hist. Nat. des Poiss. t. ii. p. 46.
Richardson's Fauna Boreali Americana, pt. 3d, p. 1, et fig.

In the ponds of many portions of the State, this is quite a common species, and in the spring and autumn is not unfrequently met with in the markets. Specimens are seldom taken more than 12 or 15 inches in length.

This beautiful fish is of a greenish yellow *above*—with golden yellow sides crossed by seven transverse dark bands, those upon middle of body broadest: *beneath,* white. The length of the head compared to the length of the body, is as one to three. The *preoperculum* is margined with strong teeth, projecting forwards, those on posterior edge are the smaller. The bony *operculum* is serrated below, and terminated at its posterior angle by a spine. A membranous prolongation extends from the margin of the *suboperculum.* Humeral bones grooved. The portion of the head between, and in front of, the eyes, smooth—portion back of eyes, bony. *Eyes* of moderate size—pupils black, irides golden. The anterior nostrils much in advance of the posterior, which are larger. The *lateral line* commences high above the posterior angle of the operculum, and assuming the curve of the body, is continued to the base of the tail. The first Dorsal fin is as long again as high: the second Dorsal is one third shorter than the first.

The Pectoral fins commence on a line with the posterior angle of the operculum, and are one third as long as high.

The Ventral fins arise about four lines back of pectorals.

The Anal fin is higher than long: anus is situated three lines anterior to it.

The Dorsal and Caudal fins are brownish. The Pectoral, Ventral and Anal fins are scarlet.

The fin rays are as follows: * B. 7; D. 13. 2–14; C. 17; P. 15; V. 1–5; A. 2–8.

LABRAX. Cuv.

Generic characters. *Two dorsal fins, distinct, separated; the rays of the first, spinous; those of the second, flexible: branchiostegous rays 7: tongue covered with small teeth: teeth on both jaws, on the vomer and palatine bones: checks, preoperculum and operculum, covered with scales: suborbitul bone and suboperculum without serrations: preoperculum notched below, serrated on its posterior edge: operculum ending in two points, diverted backwards.*

L. *lineatus.* Cuv. *The striped Basse.*

Trans. Lit. et Philosoph. Society of N. Y. p. 413.
Mc Murtrie's Cuv. v. ii. p. 98.
Cuv. et Valenc. Hist. Nat. des. Poiss, t. ii.

This fine species, which sometimes weighs 75 pounds, is taken in considerable numbers upon our coast. Large quantities of small basse are caught with nets near Chelsea and Nantasket beaches. It is generally found upon shoals near the land, where frequently a dozen or more may be seen at a time beneath the water, quietly lying upon the rocky bottom. In the winter, this fish goes up into the rivers and arms of the sea. Oftentimes basse of considerable size are taken in Boston harbor. I saw in Boston market, on the 26th of July, 1837, a specimen 3 feet and 10 inches long, weighing 36 pounds, which was taken from one of the bridges leading out of the city. The flesh of this species, particularly of the larger ones, is rather coarse, but meets with a ready sale in a fresh state : in 1836, a small number of barrels, (sixty-seven,) were packed and inspected.

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* The letters indicate the different fins: B. the branchial rays. D. those of the Dorsal fin; C. Caudal; P. Pectoral; V. Ventral; A. Anal.

The upper part of the body is silvery brown: lower part of sides and abdomen a beautiful clear silver color; eight or more longitudinal black bands on each side, commencing just back of opercula; the upper bands running the whole length of the fish, the inferior ones terminating directly above the anal fin. Length of head to length of entire fish as 1 to 5. *Head* covered with scales throughout its whole extent, save the frontal and suborbitar bones. *Eyes* moderate in size, pupils black, irides golden: diameter of eye, equal to about half the distance between eyes. Opercula in portions, cupreous. *Teeth* in jaws numerous, teeth also upon palatine bones: *tongue* rough. *Lower jaw* the longer. *Nostrils* double; the posterior larger. *Preoperculum*, at its posterior margin, finely serrated throughout its whole length; at its inferior margin, denticulated. *Operculum*, at its posterior margin, furnished with two spines, the lower of which is the larger. *Lateral line* very distinct, arising above the superior spine of the operculum, and running through the centre of one of the longitudinal bands.

The first Dorsal fin is two thirds the length of the head: the third and fourth rays are the longest.

The first ray of the second Dorsal is spinous; the height of this fin is equal to more than half its length.

The Pectoral fins arise beneath and behind the inferior spine of the operculum; their length to their height is as 1 to 4.

The flesh-colored Ventrals arise just back of pectorals: their first ray is spinous. These fins are rather longer than pectorals.

The Anal fin arises opposite the middle of the second dorsal; its first three rays are spinous: this fin is one third shorter than first dorsal: its length to height is as 1 to 3.

The fin rays are as follows: D. 9. 1–12; P. 18; V. 1–4; A. 3–11; C. 18.

L. *mucronatus*. Cuv. *The small American Basse.*

Cuv. et Valenc. Hist. Nat. des Poiss. t. ii. p. 86.

In the spring and autumn, this species is brought to Boston market, from the mouths of the neighboring rivers and the ponds to which the sea has access. It is commonly called *white perch.* Its usual weight is about half a pound. The largest specimen I have met with, was procured in Quincy market, Dec. 22, 1837; it measured 15 inches in length, and weighed 1 3-4 pound, and its stomach contained a specimen of the *Leuciscus crysoleucas* more than five inches in length.

The color is a silvery gray: in very large specimens, all the upper part of the body, as well as the head and fins, are of a rusty black. Length of head, compared to that of body, as 1 to 4: depth of body across base of pectorals, four inches and two lines. *Upper jaw* protractile: very fine teeth, thickly set in both jaws. *Eyes* large, pupils black, irides silvery. *Nostrils* double, posterior nearly as large again as the anterior. Operculum, preoperculum and maxillary bones covered with scales. Head back of, and between eyes, scaly. The space between nostrils, and in front of eyes to maxillary bones, destitute of scales. *Preoperculum*, denticulated behind and below; denticulations much smaller upon the upper portion of posterior edge. The lowest edge of operculum very slightly serrated; a spine at its posterior angle, and above this an obtuse point. The *lateral line* commences at the upper posterior portion of the operculum, and inclining a little upward, is lost on the membrane connecting the middle rays of the caudal fin.

The first Dorsal fin commences about six lines back of the base of the pectorals, and is about half as high as long.

The second Dorsal fin is rather more than two thirds the length of the first dorsal: its first ray is spinous.

The Pectorals commence on a line with the posterior angle of the operculum: length equal to one third their height.

The Ventrals arise back of the pectorals, and are two lines shorter than those fins.

The Anal fin commences on a line with the fifth ray of the second dorsal: the height and length of this fin are equal.

The Anal and Dorsal fins terminate on the same plane.

The fin rays are as follows: D. 9. 1–12; P. 15; V. 1–5; A. 3–9; C. 17.

CENTROPRISTIS. CUV.

Generic characters. *A single dorsal fin: branchiostegous rays 7: all the teeth small and crowded: no canini: preoperculum dentated, and operculum spinous.*

C. *nigricans.* Cuv. *The Black Perch.*

Trans. Lit. et Philosoph. Soc. N. Y. p. 415, et fig.
Mc Murtrie's Cuv. v. ii. p. 107.
Cuv. et Valenc. Hist. Nat. des Poiss. t. iii. p. 14.

I have never heard of this species, the *Perca varia* of Mitchell, having been taken north of Cape Cod. The only specimen met with, Dr. Yale kindly sent me from Holmes Hole, where it is called *black fish* and *black basse:* he informs me that it has been taken there in great numbers in May, June and July, and carried to the New York market—and adds, "it is perhaps the most delicious fish that is caught."

The body of the specimen before me is elongated—compressed—of a dark brown, almost black color *above*:—lighter *beneath*. Color of head, sea or bronze green—scales large. Length of fish, 1 foot: greatest depth 3½ inches. Length of head to posterior angle of operculum, one third the length of the fish: head between, and in front of eyes, smooth. *Eyes* one half inch in diameter—less than the distance between eyes. *Nostrils* double—just anterior to anterior superior angle of eye—posterior, the larger. *Jaws* equal in length, armed with a great number of minute sharp teeth. Lips fleshy. Whole posterior edge of preoperculum, denticulated:—inferior edge serrated—scales upon preopercle smaller than those upon body. A small spine at posterior angle of *operculum*, below which is a broad fleshy elongation projecting beyond it. Humeral bone denticulated. The *lateral line* arises at the lower edge of the humeral bone, and assumes the curve of the body.

The Dorsal fin arises about a line back of the humeral bone—its first ten rays are spinous, each having a fleshy tentaculum suspended from its extremity. The first ray is shortest—the third ray is longest. The eleven fleshy rays are higher than the spinous ones:—the membrane of the whole fin is white, crossed by dark bars.

The Pectoral fins arise just below the fleshy projection of the operculum—their length to their height is as 1 to 4.

The Ventral fins are in front of pectorals—the middle rays are longest:—the rays are nearly black, while the connecting membrane is white.

The Anal fin commences back of soft rays of dorsal:—the first two rays are spinous. Fin higher than long, and barred like the dorsal.

The Caudal fin is slightly convex in its middle:—its length equal to half its height: the connecting membrane of its rays black, blotched with white.

The fin rays are as follows: B. 7; D. 10, 11; P. 17; V. 6; A. 2–9; C. 18.

POMOTIS. Cuv.

Generic characters. *A single dorsal fin: branchiostegous rays* 6*: small and crowded teeth: body compressed and oval: a membranous prolongation at the angle of the operculum.*

P. *vulgaris.* Cuv. *Fresh water Sun Fish. Pond Perch.*

Shaw's Zoology, vol. iv. pt. 11, p. 482.
Lit. et Philosoph. Trans. N. Y. i. p. 403.
Mc Murtrie's Cuv. vol ii. p. 108.
Cuv. et Valenc. His. Nat. des Poiss. t. iii. p. 91.
Jardine's Naturalist's Library, vol. i. Ichthyology, p. 162.
Fauna Boreali Americana, p. 24 et fig.

This very common species in the numerous ponds of our State is taken with the *Perca flavescens*—*Leuciscus crysoleucas*—*Esox reticulatus*, &c., and is generally known by the vulgar name of *Bream.* It rarely exceeds eight inches in length. Though seldom brought to market, it is considered by many, an excellent edible fish. In the Naturalist's Library, it is said to be "of unobtrusive colors," while, in truth, it is one of our most beautiful species—vieing oftentimes in the brilliancy of its coloring with tropical fishes.

The specimen before me, measures seven inches in length: length of head to outer angle of operculum nearly two inches: depth of body, on a line with base of pectorals, three inches. General color greenish brown with spots of blue and yellow upon each scale: longitudinal, undulating deep blue lines across preoperculum and operculum, with rusty yellow blotches interspersed. Scales upon body, large—smallest at base of fins. Head, between eyes, naked, and of a darker color than the body generally. *Nostrils* double—anterior tubular: teeth in jaws very minute and sharp: upper jaw protractile. *Eyes* large, nearly half an inch in diameter. At posterior angle of operculum, a large black spot embracing a portion of the operculum, and a fleshy prolongation having a bright scarlet colored margin. Just above this spot, arises the *lateral line*, which assumes the curve of the back, and is lost at the base of the tail. The back curves very gradually as far as the posterior extremity of the dorsal fin, then abruptly gives place to the fleshy portion of the tail. All the fins more or less colored with black. Length of the pectoral fins nearly two inches. Anus large, corrugated—two lines anterior to the anal fin.

The fin rays are as follows: D. 10–12; P. 13; V. 1–5; A. 3–10; C. 17.

I am induced to believe, from the remarks of several anglers with whom I have conversed and corresponded, that another species of *Pomotis* inhabits our waters.

FAMILY II.

BUCCÆ LORICATÆ.

PRIONOTUS. Lacep.

Generic characters. *Head nearly square, covered with bony plates: gill-cover and shoulder-plate ending in a spine directed backwards: body elongated, nearly round: two dorsal fins, the rays of the first, spinous; those of the second, flexible: teeth in jaws, in front of vomer, and upon palatine bones, pointed, small and numerous: gill-opening large: three detached rays at the base of each pectoral fin.*

P. *strigatus.* Cuv. *Sea Robin. Gurnard. Grunter.*

Trans. Lit. et Philosoph. N. Y. p. 430 et fig.
Cuv. et Valenc. Hist. Nat. des Poiss. t. iv., p. 86.

This species which is very well described, and tolerably figured by Mitchell as the *Trigla lineata*, is frequently taken in the vicinity of Holmes Hole, while fishing for other species, but is not used.

A beautiful specimen received from Dr. Yale enables me to offer the following description:

Body above *lateral line* of a slate color, with a few black spots irregularly distributed; sides lighter, with a reddish tint; abdomen, white. Besides the lateral line which is very obvious, a broader brownish line runs parallel to it beneath, arising under the humeral spine, and running the greater part of the length of the body, broken at its posterior extremity into interrupted points or spots.

Length of specimen, nine inches:—length of head, nearly three inches: head broader than the body; its depth equal to half of its length. Head is made up of seven distinct bony plates covered with sparse small black points, which form a perfect helmet of defence. The whole upper part of head—occiput, space between eyes, and anterior portion to snout, composed of one plate—this portion is roughened throughout its whole extent by irregular corrugations, and terminates posteriorly in two strong spines;—minute spines are seen also above eyes, at their upper anterior and posterior angles: this plate is anteriorly widely but not deeply truncated. The operculum is a separate plate, of an irregular triangular form, having two spines at its posterior extremity—the lower larger, and pointing directly back; the upper pointing upwards: operculum covered with striæ, radiating from the anterior portion on each side of the spine towards the circumference. Opercle separated from preopercle, by a membrane, which enables it to be quite moveable: a wide membrane also borders its whole margin. The preoperculum is rather small and triangular—slighty moveable—divided at its lower portion by a horizontal serrated bony ridge which terminates in a naked spine;—beneath this ridge, the inferior portion is corrugated and granulated: from base of preopercle, radii diverge to its upper portion. Suborbitar bones roughened like top of head: cheek bones covered with elevated striæ, slightly serrated upon their whole lower margin, and strongly serrated anteriorly on each side of snout.

Snout half of an inch wide—four lines long—naked—situated in front of emargination of frontal bone. *Eyes* located towards upper part of head—oblong—longest diameter equal to the distance between eyes. *Nostrils* small—situated half way between eyes and extremity of snout, in the membranous division between the bony plates. *Jaws* armed with very numerous small teeth: upper jaw projecting beyond the lower. *Tongue* colorless, fleshy, naked. A strong ridge upon humeral bone serrated on its under edge, terminating in a naked spine.

The first Dorsal fin arises on a line with the termination of the occipital spines—is situated in a groove which partially receives it, when closed—light colored, with a black blotch upon the upper portion of the membrane between the fourth and fifth rays: first ray spinous, and serrated upon its entire front: second and third serrated at their upper anterior portion: third and fourth rays longest. Fin one third longer than high.

The second Dorsal is one third longer than the first.

The Pectoral fins are one third the length of the body—nearly black, with very numerous narrow transverse bars. On a line with the base of the pectorals, beneath them, three fleshy appendages are seen, somewhat similar in their appearance to the fin rays: the upper, which is the longest, is half the length of the pectorals.

The Ventrals are situated beneath the pectorals

—white: their longest rays are equal to two thirds the length of the pectorals. The first ray shortest, spinous.

The Anal fin equal in length to second dorsal.

The Caudal fin is nearly straight at its extremity.

The fin rays are as follows: D. 9–13; P. 12; V. 6; A. 11; C. 15.

P. *Carolinus*. Cuv. *The Web-fingered Grunter.*

Trans. Lit. et Philosoph. Soc.—p. 431, et fig.
Cuv. et Valenc. Hist. Nat. des Poiss. t. iv. p. 90.

Under the name of *Trigla palmipes*, this pretty species is described and figured by Mitchell, in his "*Fishes of New York.*" I have seen but one specimen, for which I am indebted to Dr. Yale. This specimen, as it lies before me, presents the following characters:

Body *above*, of a reddish brown color, with irregular blotches and shadings of a darker brown: *beneath*, nearly white. Branchial membrane, fuliginous. The *lateral line*, arising between the occipital spine and the posterior superior edge of the operculum, is conspicuous throughout its whole length, but more so at its origin, and is continued in a straight line to the middle of the base of the tail.

Length of specimen thirteen inches: length of head three inches: head slightly broader than the body: greatest width of head two inches. The description of the bones of the head, and situation of the eyes, of the "*strigatus*," answers perfectly to the species before me. *Nostrils* of moderate size, situated half of an inch back of the extremity of the snout; sides of snout deeply serrated. *Jaws* armed with numerous teeth—upper jaw, the longer.

The first Dorsal one third longer than high—situated in a conspicuous groove: the rays are spinous; the whole anterior of the first three, serrated, and the upper portion of the fourth. The connecting membrane is transparent, slightly dusky, marked by oblique white lines, and has a large dark brown spot between the fourth and fifth rays.

The second Dorsal is as long again as the first.

The Pectorals are large, broad, rounded—reddish brown above—slate-colored beneath, with the exception of the posterior two rays, which are white. These fins are more than one third the length of the body. Just in front of, and beneath the pectorals, are three yellow fleshy appendages, widened at their extremities—the longest of which, is one inch in length; the shortest, half of an inch long.

The Ventrals are reddish white.

The Anal commences upon a line opposite to, and terminates upon the same plane as the second dorsal.

The Caudal fin is but slightly arcuated.

The fin rays are as follows: D. 9–13; P. 14; V. 6; A. 12; C. 14.

Both these species are called "*grunter*," from the peculiar noise made by them.

COTTUS. Lin.

Generic characters. *Head large, depressed: teeth in both jaws and in front of vomer, small, sharp; none on the palatine bones: preoperculum or operculum armed with spines, sometimes both: branchiostegous rays* 6*: gill-openings large: body attenuated, naked, without scales: two dorsal fins, distinct, or very slightly connected: ventral fins small.*

C. *Groenlandicus.* Cuv. *The Greenland Sculpin.*

Cuv. et Valenc. Hist. Nat. des Poiss. t. iv. p. 185.
Fauna Boreali Americana, p. 46 et 297, et fig.

This beautiful species, which is a favorite food of the Greenlanders, I have seen in large quantities in the small coves at Nahant, and often taken, while fishing from the rocks there, for the *Sea-perch* or *Conner.* It is undoubtedly common along our whole coast. The specimen before me was taken from one of the wharves in Boston.

Length of my specimen thirteen inches, being a few lines only shorter than Richardson's specimen, which he so clearly and minutely describes, and accurately figures. Upper part of body dark brown, with large clay-colored blotches on top of head and upon gill-covers—with a few smaller ones on back and sides, and small circular yellow spots on sides towards abdomen. Large circular perfectly white spots upon abdomen, beneath the pectorals. The sides above and beneath the *lateral line* roughened by granulated tubercles. Length of head four and a half inches: width across occiput three inches; greatest depth two inches. Head protected by several spines; those upon its top, blunted; those on gill-covers longer, with projecting sharp points. The *nasal spines* are about three inches in length, recurved: at posterior superior angles of eyes a strong slightly recurved spine, stouter than the nasal. Upon the occiput are situated two spines still stronger, and erect; between these and the former, is a quadrangular depression. The *preoperculum* has three spines, two of which are situated at its superior angle; the upper of these spines is much the largest, and points upwards; the second is smaller and nearly straight; the third and smallest, at its inferior angle, points directly downwards. The *operculum* is armed with two spines, the larger, at its superior angle; the second, much smaller, at its inferior angle. A scapular spine is prominent. *Eyes* circular, six lines in diameter. Gape of mouth very large; distance between tips of jaws, when distended, two inches two lines. Upper jaw the longer: jaws armed with numerous very small, sharp teeth. *Nostrils* tubular, three lines in front of eyes. Throat yellowish white, sprinkled with minute fuliginous specks.

The Dorsal fin commences on a line anterior to scapular spine, rounded, of a dark brown color, variegated with yellow: length to height as three to two.

The second Dorsal arises at termination of first, appearing to be a continuation of that fin, brown, with several transverse yellowish bars.

The Pectoral fins are very broad, arising in front of the first dorsal: rays orange-colored: length of fin, less than height of first rays. Upon the under side of several of the rays of this fin, are roughened granulations.

The Ventrals are small, white, with three transverse black bars. These fins are two inches in length.

The Anal fin is situated back of second dorsal, and barred like that fin: its height half of its length.

The Caudal fin is half as high as long, rays black, the connecting membrane of the rays yellowish.

The fin rays are as follows: D. 10–18; P. 17; V. 3; A. 13; C. 16.

This species is exceedingly voracious; in the stomach of one, I found three entire specimens of the *Portunus pictus*, of considerable size: in others, I have seen large quantities of the *Echinus granulatus*, and several species of *algae*.

C. *Virginianus.* Willoughby. *The Common Sculpin.*

Trans. of the Lit. et Philosoph. Soc. N. Y. p. 380.
Cuv. et Valenc. Hist. Nat. des Poiss. t. iv. p. 181.
Fauna Boreali Americana, p. 46.

Our most common species of Cottus,—the pest of the numerous boys and idlers who are constantly fishing from the wharves and bridges for "*tom cod*," "*flounders*," and the other fishes usually taken at such localities,—Mitchell described under the specific name of *octodecimspinosus*, and Cuvier retains this name, although he acknowledges the species had been previously described by Willoughby, from a specimen sent him from Virginia, by Lister. Even if the specific name distinguished it from the "*C. Scorpius*," which is not the case, both species having the same number of spines, I should not have hesitated to pursue that course which is generally acknowledged to be the most honorable, and to have preserved the name proposed by its first describer.

Specimen before me, eleven inches long. Body much more elongated than that of the "*Groenlandicus*," of a light brown color above, with darker irregular blotches, looking, when carefully examined, somewhat like transverse bands. *Lateral line* very prominent, commencing at scapular spine and running a straight course to tail, being less marked at its posterior extremity. A few small tubercles upon sides near lateral line. *Throat* pure white. *Abdomen* white, slightly tinged in portions with fuliginous stains.

Length of head, one third the length of body; greatest width equal to its greatest depth. *Twenty spines* upon and about head; ten on each side: all naked at their extremities. *Nasal spines* small, recurved. *Post-orbitar spines* slightly longer than nasals, pointing directly backwards, being hardly raised from the top of the head. *Occipital spines* erect, but slightly recurved, stouter than those just spoken of. Three spines upon *preoperculum;* that at posterior angle, ten lines long, naked throughout its greatest extent, very stout, extending back in a straight line as far as extremity of opercular spine;

directly below the base of this spine, a very small one, only two lines in length, pointing obliquely backwards and downwards: at inferior angle of preopercle, a spine nearly half an inch long, pointing downwards and forwards. Two spines upon *operculum;* the larger, nearly two inches long, passes from its upper anterior portion to posterior angle, pointing obliquely backwards; the other, quite small at inferior angle, pointing directly downwards. *Scapular spine* three lines long. Humeral spine strong, one half inch in length.

Eyes six lines in diameter; pupils black, irides golden: distance between eyes, four lines. *Nostrils* small, tubular. *Jaws* armed with numerous sharp, compact teeth. Upper jaw, the longer.

The first Dorsal fin is of a dark brown color, irregularly banded with yellow: the rays are much stouter than those of the same fin in the "*Groenlandicus;*" the extremities of the first five rays project beyond the connecting membrane. Length of fin greater than its height.

The second Dorsal commences at the termination of the first, and is one third longer than that fin; and is of a greenish yellow color, with three transverse black bands.

The Pectorals are large, rounded; the rays of a dirty white color, much smaller than those of this fin in the "*Groenlandicus;*" the connecting membrane of fin, white, crossed transversely by four regular transverse black bands.

The Ventrals commence just back of the second dorsal. Its length to its height as 3 to 1; white, irregularly barred.

The Caudal fin is even at its extremity: yellowish, with three regular transverse dark bars; its height to its length as 2 to 1.

The fin rays are as follows: D. 9–16; P. 17; V. 3; A. 14; C. 12.

C. *aeneus*. Mitchell. ***The brazen Bullhead.***

Lit. et Philosoph. Soc. Trans. N. Y. p. 380.
Cuv. et Valenc. Hist. Nat. des Poiss. t. iv. p. 189.

This species is taken from our wharves with the "*Virginianus.*" Like that fish, it is very voracious, catching at almost any kind of bait offered to it, and distending itself immensely with food.

My description is drawn up from a specimen twelve inches in length. All upper part of body of a yellowish brown color, shaded throughout with fuliginous blotches, which upon the head prevail over the yellow: on sides of abdomen, beneath the *lateral line*, lighter: beneath, and covered by pectorals, a broad band of very minute black points extends even beyond the anus, along the edge of the anal fin; the portion in front of anus, contains one or more rows of well-marked large, circular, yellow spots. Entire under surface of head also sprinkled over with similar black points. Greatest depth of specimen equal to one fourth its length: greatest width across back of head equal to one third its length. Length of head to whole length of fish, as five to twelve: upon each side of head, nine more or less prominent spines, those on the gill-covers the largest: one, just above nostrils, three lines in length and incurved; a second, resembling a blunted tubercle at the upper posterior angle of eyes; a third, rather sharper than the second, forms the posterior boundary of the head. A strong, sharp spine, half an inch in length, is situated upon the supra scapular bone. The *operculum* has two spines; the largest, one quarter of an inch in length, at the posterior angle: the second, quite small at the inferior angle, almost concealed in the flesh, pointing downwards. The *preoperculum* has three spines; the largest, nine lines in length, is sharp, naked at its posterior portion, and pointing upwards; the second, much smaller, is also naked, and situated at the base of the first, appearing as if a bifurcation of it, pointing backwards; the third, is placed at the inferior angle, and, like the similarly situated spine of the operculum, is concealed. A small spine upon infra scapular bone. A large depression on the top of head; bounded, between eyes, by orbitar ridges; back of eyes it is broader, and bounded on sides by a longitudinal ridge. *Mouth* very large; lower jaw the shorter; both jaws armed with numerous, small, sharp, recurved teeth, compactly placed together: when mouth is closed, the intermaxillary bone forms a protuberance between the two anterior spines. *Nostrils* small, tubular. *Eyes* large, pupils black, irides reddish yellow; distance between eyes eight lines.

The *lateral line*, which is quite prominent, commences just above the humeral spine, and continues a straight course to the middle of the base of the tail. One or two irregular rows of very obvious roughened tubercles *above*, and quite a number of smaller tubercles scattered over the sides, *beneath* the *lateral line*.

The fins are yellowish, with black bands.

The first Dorsal is rounded, and connected with the second dorsal by a membranous prolongation.

The second Dorsal is about one third longer than the first.

The Pectoral fins, when expanded, are rounded: the rays large and stout.

The Ventrals are composed of three rays: yellowish white, with two transverse dark bands.

The Anal fin is shorter than the first dorsal, with three or four oblique black bands.

The Caudal fin is in length equal to half of its height.

The fin rays are as follows: D. 10–15; P. 16; A. 13; V. 3; C. 12.

ASPIDOPHOROIDES. Lacepede.

Generic characters. *Body octagonal, covered with scaly plates; head thicker than the body, with points and depressions above, flattened below; teeth in both jaws only, none on the vomer; snout with recurved spines; branchiostegous rays* 6*; body tapering to the tail; but one dorsal fin, distinct.*

A. *monopterygius*. Cuv. *The Bullhead.*

Plate I. Fig. 1.

Cuv. et Valenc. Hist. Nat. des Poiss. t. iv. p. 224.
Fauna Boreali Americana, p. 50.

Early in May, 1838, I received three specimens of this fish from Mr. Jonathan Johnson, Jr., of Nahant, who took them from the stomachs of *haddock* he had just captured within two miles of that place. They were each more or less mutilated; one of them, however, is sufficiently perfect to allow me to present the following description, and to enable my friend, Dr. Wyman, to figure it.

Length of specimen, four inches. Color *above*, a light brown, with six transverse dark bands, extending from head to tail, those near the head broader: *beneath*, lighter. Body elongated, gradually tapering to tail, divided longitudinally by eight rows of scaly plates. Those just back of head much the largest. Upon top of head, two rows of these scales: two rows on sides: two beneath, in front of dorsal, and but six rows back of that fin. The body is four-sided in front of the dorsal fin. The angles of the large scales on the back, form prominent ridges, and between them is thus formed a groove, which extends to posterior extremity of dorsal fin: back of that fin is a dorsal ridge, instead of a furrow, which passes to the tail. The same distribution of these scaly rows exists *beneath* fish as upon *upper part* of body. Length of head equal to one fifth length of body: width of head greater than that of body. *Eyes* very large: orbitar bones prominent: whole head bony. A longitudinal furrow extends from before eyes, between them to occiput. A transverse depression exists back of eyes, and also another at occiput. The *snout* has two recurved spines at its extremity, and a third, smaller one, back of them, curving forwards. *Mouth* small; numerous minute teeth in both jaws. The operculum terminates in a spiny process.

The Dorsal fin is situated upon the posterior half of the body, at the extreme portion of the dorsal furrow.

Owing to the imperfect state of specimen, it is impossible to be entirely accurate with regard to the number of the fin rays: they are, however, very nearly as follows: D. 5; P. 10; V. 4; A. 4; C. 16.

This species is unquestionably the fish which was first described by Bloch as the "*Cottus monopterygius*," and minutely described as the "*Aspidophorus monopterygius*" by Cuvier, in the fourth volume of his "Histoire Naturelle des Poissons." Lacepede formed the genus "*Aspidophoroides*," to receive the species above described, it being the only known "Aspidophorus" with a single dorsal fin. At the time this genus was formed, the species of which we have been speaking was supposed to have been brought from the East Indies. Cuvier, however, in his description, says he has not received it from the East Indies in any of his numerous collections from that quarter of the world; and finally, Richardson, in his "*Fauna Boreali Americana*," observes, "that it has lately been discovered to be an inhabitant of the Greenland Seas, so that this subgenus belongs entirely to the northern hemisphere, and chiefly to the higher latitudes."

HEMITRIPTERUS. CUV.

Generic characters. ***The head depressed, and two dorsals, as in the Cottus; no regular scales on the skin, but teeth in the palate. The head is bristly and spinous, and has several cutaneous appendages. The first dorsal is deeply emarginate, a circumstance which has led some authors to believe they had three.***

H. *Americanus.* Gmelin. ***The Sea Raven.***

Trans. Lit. et Philosoph. Soc. N. Y. p. 382.
Cuv. et Valenc. Hist. Nat. des Poiss. t. iv. p. 268.
Fauna Boreali Americana, p. 50.

The *Sea raven,* or *deep water sculpin,* as it is generally called by our fishermen, is the only known species of the genus "*Hemitripterus.*" It was considered a "*Cottus*" by Pennant, and a "*Scorpæna*" by Gmelin and Mitchell.

It is taken in deep water, in the neighborhood of ledges, by the cod fishers, and grows to the length of two feet. This species varies exceedingly in its color. Thus of *three* fine specimens lying before me, one is of a deep blood red color; a second, of a pinkish purple; the third, of a yellowish brown, darker on the back; each, however, variegated on the head and sides and fins with irregularly defined markings: body, *beneath,* yellowish. The coloring matter of the surface tinges the fingers when rubbed upon it. Surface of body destitute of scales, granulated, and studded with innumerable tubercles, which are quite large high up on the back, and very small or almost entirely disappearing beneath the *lateral line.* *Head* large, spinous, hideous in appearance. Length of head to entire length of body, measuring to posterior extremity of operculum, nearly as one to four: width of head across opercula equal to its length. Twelve, more or less prominent, blunted spinous tubercles on each side of median line of head, the sharpest pointed, just back of nostrils: the largest, at posterior angles of eyes, and just in front of dorsal fin. Fleshy cirrhi are suspended from several portions of the head, such as anterior and posterior angles of eyes and about snout: those hanging from over eyes appear like a broad fringe. Orbitar cavity large. *Eyes* moderate in size, pupils black, irides yellowish brown. Distance between superior angle of eyes rather less than one fourth the length of the head: space between eyes deeply depressed. *Operculum*, at its posterior angle, armed with two strong spines, similar to those of the "Cottus." *Jaws* about equal in length: twelve digitated cirrhi are suspended from under jaw. *Mouth* very large. *Teeth* in jaws and palate numerous, sharp, recurved: teeth also in pharynx. The *lateral line*, which is tubercular, commences just above posterior angle of operculum, and curving with the body, terminates at the base of the caudal rays. A strong spinous tubercle arises from humeral bone.

The first rays of the first Dorsal are longest; the seventh, eighth and ninth rays are next in length: in other words, this fin at first sight appears as if divided, or as two fins. Delicate tentaculæ are suspended from the extremities of the rays of this fin.

Just back of the first Dorsal arises the second, appearing as if connected, and hence described by Mitchell as *one fin;* height of this fin to its length as one to three.

The Pectorals are very large, when expanded resembling a wing; the rays are uncommonly distinct. These fins arise from the entire lower edge of the branchial aperture: height to length as four to two and a half.

The Ventrals arise just back of the first rays of the pectorals; they are composed of three rays—the first ray shorter than the second, and exceedingly stout.

The Anus is situated equally distant from the ventral and anal fins.

The Anal fin commences and terminates on the same plane with the second dorsal: the rays of this fin are deeply divided at their extremities: length of fin to its height as three and a half to one and a half.

Length of Caudal fin to its height as two to three:—the color of rays similar to that of the body.

The fin rays are as follows: D. 16, 13; P. 18; V. 3; A. 15; C. 19.

SEBASTES. CUV.

Generic characters. *Body oblong, compressed, covered with scales ; all the parts of the head also covered with scales ; eyes large ; preoperculum and operculum ending in three or more spines ; branchiostegous rays 7 ; teeth small, numerous, equal in size, placed on both jaws, the vomer and palatine bones ; a single dorsal fin, part spinous, part flexible ; inferior rays of the pectoral fin simple.*

S. *Norvegicus.* Cuv. *The Norway Haddock.*

Pennant's British Zoology, p. 226 et fig.
Mc Murtrie's Cuv. vol. ii., p. 122.
Cuv. et Valenc. Hist. Nat. des Poiss, t. iv. p. 327.
Yarrell's British Fishes, vol. i., p. 73, et fig.
Fauna Boreali Americana, p. 52.

With us, this is not a common species; it is taken while fishing near shoal ledges contiguous to deep water. Although seldom offered for sale in our market, it is readily eaten by the Norwegians, and is a very palatable dish, as I learned from an epicure of this city, who, having met with a specimen, and thinking it to be the "*Sciena gigas*" of Mitchell, had it carefully cooked, and was much delighted with his rarity. By our fishermen it is known by the names of "*Rose fish,*" "*Hemdurgan,*" *and* "*Snapper.*" It attains the length of two feet. The following description is drawn up from a beautiful recent specimen, ten inches in length.

All upper of the body of a reddish color:—darker upon head and back, lighter upon sides:

nearly white beneath. A brown blotch upon posterior portion of operculum. All the fins red. Length of the head, from tip of lower jaw when closed, to posterior angle of operculum, one third the length of the fish; top of head, flattened. Operculum armed with two spines. Suboperculum and interoperculum, have each one spine: posterior edge of operculum has five spinous processes. Supra scapular and subscapular bone, have each one spine; a second, scarcely perceptible spine upon supra scapular bone: two spines upon suborbitar bone: a small, exceedingly sharp pointed spine on each side of base of intermaxillary bones. Four spines upon upper orbitar edge; one, at upper anterior angle of eye; a second, with its base continued along the greater portion of upper edge; and two smaller ones, behind. A very minute spine upon the lower orbitar edge, beneath centre of eye—and two spines projecting backward upon occiput. *Eyes* very large; pupils black; irides yellow: diameter of eye equal to one third length of head: distance between eyes equal to five eighths the diameter of the eye. *Jaws* armed with numerous, minute, sharp teeth: upper jaw very protractile—an emargination in its centre, into which the extremity of the lower jaw shuts, when the mouth is closed. Chin prominent. *Teeth* in vomer and palatine bones.

The *lateral line* arises above the operculum, and taking the curve of the body, terminates at the caudal rays: about thirty-six sharp points are seen in the course of the lateral line.

The Dorsal fin commences on a line with the upper opercular spine, its anterior half composed of spinous rays; the length of its highest rays equal to about one third the length of the fin: posterior half of fin composed of membranous rays; length of this portion equal to one half the length of spinous portion.

The Pectorals commence on a line with the third Dorsal ray:—length of fin equal to one third its height: the middle rays the longest.

The Ventrals arise just back of the pectorals; the first ray is spinous: the second ray, the longest.

The Anal's first soft ray is equal to the length of the fin: the first three rays spinous.

The length of the Caudal fin is one third less than its height.

The fin rays are as follows: D. 15, 15; P. 18; V. 1–5; A. 3–7; C. 19.

CRYPTACANTHODES. Nobis.

Generic characters. *Body elongated, and very much compressed, gradually tapering to tail, destitute of scales: head broad, with no projecting spines, but the angles of the gill-covers;—the scapular and humeral spines, and the inferior edge of the preoperculum prominent to the touch. Numerous depressions in frontal, suborbitar, inferior maxillary and preopercular bones: branchiostegous rays 7; mouth oblique; a single dorsal fin composed of strong spinous rays enveloped by a common membrane, runs nearly the entire length of the fish, and unites as well as the anal with the tail. No ventral fins.*

C. *maculatus*. Nobis. *The spotted Wry-mouth.*

Three specimens of a fish evidently belonging to the *Buccatæ Loricatæ* have fallen under my observation, for the reception of which I know of no established genus. I am compelled therefore to constitute a genus in which it may be placed.

This I do with no slight reluctance; and, anxious only to throw more light upon this branch of study, I shall feel highly gratified, should it be received and retained by succeeding Ichthyologists.

The first specimen met with, was purchased by the "Boston Society of Natural History" some years since, with several other species, and was said to have been taken in the outer basin of Boston harbor: this specimen is still in the cabinet of that society; it is about twenty-one inches long, and will serve for my description. It is of a dirty reddish white color, the cuticle having been removed before it was purchased. The second specimen, larger, of a reddish brown color sprinkled over with dark brown blotches, was sent me by Mr. Jonathan Johnson, Jr., of Nahant, who took it while fishing in the vicinity of that place. The third specimen was taken from the stomach of a *haddock*, and kindly sent me by Mr. Holbrook, fishmonger in Quincy Market. This last specimen was twelve inches in length, of a dull flesh color, covered with innumerable very minute black dots, and above and beneath the lateral line, an interrupted row of dark brown blotches extended from pectoral fins to tail; these blotches larger at anterior portion of body, and more numerous towards the tail. Top and sides of head, snout, and anterior portion of underside of lower jaw marked with moderate sized spots of a deeper brown than those of the back.

The specimen before me is twenty-one inches in length: its greatest width two and a half inches. On each side of top of head, two prominent bony ridges run directly back from posterior angle of eyes to occiput. At posterior angle of operculum; at same angle of preoperculum; the whole lower edge of preopercle; the scapular bones; all seem like sharp points and edges concealed by the skin. The *operculum* is of a triangular form, one inch in length, bony beneath skin, with its posterior angle acute, united to the preoperculum by its anterior superior angle by means of a membrane. *Preoperculum* large; its superior and posterior angles obvious to the touch;—its lower edge sharp, and feeling as if it was divided into two ridges. *Eyes* circular; diameter of eye equal to half the distance between eyes. *Nostrils* tubular, situated on each side of snout, just at the edge of the intermaxillary bones. *Lips* fleshy; jaws equal; numerous minute teeth in jaws and upon palatine bones—*mouth* situated obliquely; *lateral line* straight, looking like interrupted dots.

The Dorsal fin arises on a line above the middle of the pectoral fins, and is continued to, and united with the caudal: all its rays are spinous, strong, distinct, and concealed by a common membrane: the first few rays are shortest.

The Pectorals arise beneath the membrane of the branchiæ, as it is connected with the body: their length and half their height rounded.

The Anal fin arises upon the anterior half of body, and is similar in its form and the character of its rays and their enveloping membrane, to the dorsal fin.

The Caudal fin appears almost like the prolongation of the dorsal and anal fins. It is rounded at its extremity.

The fin rays are as follows: B. 7; D. 77; P. 13; A. 50; C. 19.

The flesh being removed from the smallest of the three specimens above spoken of, the following appearances are presented. The longitudinal ridges upon top of head; the suborbitar, inferior maxillary and preopercular bones, with deep excavations or cavities. The angles of gill-covers quite acute, as also those of scapulæ; humeral spine very prominent. A single row of teeth, in jaws; on sides, double, in front; those in front, much smaller and straight; those behind, recurved. Number of vertebræ, eighty-nine.

My generic name is derived from ϰϱυπτος, concealed—and αϰανϑωδης, spine.

GASTEROSTEUS. CUV.

Generic characters. *Body without scales, more or less plated on the sides: one dorsal fin, with five spines before it: ventral fin with one strong spine.*

***and no other rays: bones of the pelvis forming a shield, pointed behind: branchiostegous rays* 3.**

G. *Noveboracensis.* Cuv. *The New York Stickleback.*

Cuv. et Valenc. Hist. Nat. des Poiss. t. iv. p. 502, pl. 98, fig. 3.

I have seen but three specimens of this fish, and therefore conclude it cannot be as common as the two following species of "*Stickleback.*" One of these specimens was brought me from Provincetown, by Dr. Gould; another, was taken from the stomach of a *codfish*, in our market, by Mr. E. Freeman; and the third was found at Boston, by Master Henry Parker.

The specimen before me is two and a half inches in length; all its upper portion, to the *lateral line* on each side, is of a very dark brown color, almost black; beneath, silvery. Sides, armed with strong, vertical bony plates, upwards of thirty in number, diminishing in size towards the tail; those at posterior portion of the body, with a lateral crest, terminating at the base of the caudal fin. *Head*, half an inch in length. Diameter of *eye*, half a line. Lower jaw slightly projecting beyond upper. *Gill-covers* silvery. Outer edge of Ventral spine, serrated throughout its whole extent; serrations of the inner edge scarcely discernible. The second Dorsal spine much larger than either of the others. The posterior Dorsal spine very small.

The fin rays are as follows: D. 3–11; P. 10; V. 1–1; A. 1–8; C. 12.

At first sight, this resembles the "G. *trachurus.*"

It differs, however, in having the ***dorsal plates narrower;*** the ***lateral keels of the tail more prominent,*** and the ***lateral line nearer the back.***

G. *apeltes.* Cuv. *The bloody Stickleback.*

Cuv. et Valenc. Hist. Nat. des Poiss. t. iv. p. 505.

Several specimens of a species which I suppose to be Cuvier's "*apeltes,*" were brought me by my friend Rev. J. L. Russell, from Salem, where he found them in large numbers in creeks, to which the sea had access. Cuvier's description is very concise, and no reference is made to the color of the species; his specimens were undoubtedly preserved in spirits. From living specimens, I annex the following account:

Of eight specimens before me, the largest is two inches in length, and two and three quarters lines in its greatest depth. All above *lateral line,* of a greenish brown color—beneath this line, which is very perceptible, the color is darker, and is broken irregularly by the extension of whiteness of abdomen. In young specimens, the color is distributed in four or five bars, which disappear in distinctness in the mature fish.

Four moveable spines in front of the dorsal fin; the first, one half a line in length; the second, the same length; the two last, shorter; the last, shortest.

The Ventral spine, one line and three quarters in length, is serrated on its outer margin: from base of ventral spine, a lateral spine passes almost to the anus. To the under portion of the ventral spine is attached a reddish membrane, which makes this part appear as if covered with blood, when the fish is suddenly darting through the water, with this spine projecting.

The fin rays are as follows: D. 3. 1–4; P. 11; V. 1; A. 10; C. 13.

G. *pungitius.* Lin. *The ten-spined Stickleback.*

Cuv. et Valenc. Hist. Nat. des Poiss. t. iv. p. 506.
Yarrell's British Fishes, vol. i, p. 85.

This species I also received from Mr. Russell, who found it with the preceding. The general description of the "*pungitius*" answers to this species —but the appearance of the two varies in some particulars.

Length of species two inches and three lines; *greatest depth* two lines. Color grayish, with from six to ten transverse dark bands, very distinct in some specimens, in others scarcely visible. In the same specimen, these bands are much more apparent at some moments than at others, as the fish is excited by fear or other causes. Body *beneath*, silvery. *Eyes* nearly a line in width; pupil, of a deep black; iris, metallic-colored. The upper edge of Ventral spine serrated.

The fin rays are as follows: D. 10–11; P. 11; V. 1; A. 1–9; C. 13.

After death, this and the preceding species become much lighter-colored; the bands in a great measure disappear, and the careless observer would scarcely believe he beheld the same fishes as those he had lately admired in their native beauty.

In a paper read before the Boston Society of Natural History, in 1836, I noticed the "*Gasterosteus quadratus*," Mitchell, as being found in our waters. The specimen upon which I founded this belief, was in a mutilated state, and is still in the cabinet of that Society. Having met with no species of "*Gasterosteus*" since that time, with *four dorsal spines*, save the "*apeltes*"—and being therefore inclined to think that that specimen *may be* the apeltes, I am unwilling to assert that the "*quadratus*" is found in our State.

FAMILY III.

SCIENOIDES.

OTOLITHUS. CUV.

Generic characters. *Head gibbous, supported by cavernous bones: two dorsal fins: anal spines weak, and no cirrhi: some of the teeth are elongated hooks, or true canini: the natatory bladder has a horn on each side, which is directed forwards.*

O. *regalis*. Cuv. *Squeteague. Weak Fish.*

Trans. Lit. et Philosoph. Soc. N. Y., p. 396, et fig.
Cuv. et Valenc. Hist. Nat. des Poiss. t. v. 67.
Fauna Boreali Americana, p. 68.

This species, which, some years since, was found in large numbers about Nantucket and Martha's Vineyard, has of late entirely disappeared. During the two seasons that my attention has been directed to our fishes, I have not been able to procure a single specimen. Dr. Yale writes me in October, 1837;—"The *squeteague* has deserted these waters, there has not been one taken for three or four years about here; they left about the time that the *blue fish* came." Hon. Hezekiah Barnard, of Nantucket, in a letter to me, dated July, 1838, remarks;—"The *squeteague*, or *weak fish*, have disappeared since the return of the *blue fish*, who are their avowed enemy. I have conversed with our fishermen, they say they have scarce seen one for six years." Thus it appears, that while the *blue fish* was absent, *they* were abundant—and at the appearance of the *blue fish*, *they* left us.

Mitchell's description of the "*Labrus squeteague*" is as follows:—"Size commonly from a foot to fifteen inches, but often grows much larger. I weighed one, that measured twenty-seven inches in length by seven in depth, and found him heavier than six pounds. He never goes into fresh streams or ponds, but, within the limits of the salt water, is taken in almost all the places where *rock-fish* is caught. The *weak fish* is so much the companion of the *basse*, that I once gave him the specific name of *comes*. Head and back brown, with frequently a tinge of greenish. The spaces towards the sides faintly silvery, with dusky specks. These gradually disappear on the sides, until, on descending to the belly, a clear white prevails from the chin to the tail. *Mouth* wide. *Jaws* toothed, and, in the upper mandible one, two, or three teeth in front, larger and stronger than the rest, and resembling the fangs of serpents. *Throat*, in front of the œsophagus, armed above and below with collections of small teeth. Eight softish rays in the foremost Dorsal fin. Pectoral, Dorsal and Caudal fins, light or pale brown, inclining sometimes to yellowish. Anal and Ventral fins, pale yellow. *Tail*, even. Lower jaw longer than the upper. *Lateral line* arched upwards, and after its descent runs quite to the extremity of the caudal fin. *Tongue* yellow, with minute black dots around the fore part; concave, with a soft and flexible margin; has a froenum. The swimming bladder is convertible to good glue. I have eaten as fine blancmange from it, as from the isinglass of the *sturgeon*. He is a fish of a goodly appearance, and is wholesome and well tasted, though rather soft. Is brought to market in great numbers during the summer months. He is taken by the line and the seine. He is called *Weak fish*, as some say, because he does not pull very hard after he is hooked; or, as others allege, because laboring men, who are fed upon him, are *weak*, by reason of the deficient nourishment in that kind of food.

Certain peculiar noises under water, of a low, rumbling or drumming kind, are ascribed by the fishermen to the Squeteague. Whether the sounds come from these fishes or not, it is certain that during their season, they may be heard coming from the bottom of the water; and in places frequented by *weak fish*, and not in other places; and when the *weak fish* depart, the sounds are no more heard.

Rays: B. 7; P. 16; V. 5; D. 8–28; A. 13; C. 17."

UMBRINA. CUV.

Generic characters. *The Umbrina, besides the characters common to the Sciæna, has a barbule, or cirrhus, at the angle of the lower jaw; the spines of the anal fin strong and sharp; the teeth smaller and more numerous.*

U. *nebulosa.* Mitchell. *The King Fish.*

Trans. Lit. et Philosoph. Soc. N. Y. p. 408.

A single specimen of this species, which Mitchell states to grow to a larger size than a foot and a half, has been met with eight inches and a half in length, taken in a lobster pot at the Boston light-house. From this specimen, which has belonged to the cabinet of the "Boston Society of Natural History" for several years, and is at the present moment in a state of fine preservation, I have drawn up the following description.

Body elongated, slightly arched over pectorals, gradually tapering towards tail, of a dull gray color, with silvery reflections upon sides, ornamented with irregularly disposed dark bars; some, passing obliquely forwards from the dorsal fin; others, passing obliquely backwards from nape of neck; and one broader one, pursues a straight course backwards through the middle of the body, from extremity of pectorals to the tail. Body beneath, yellowish.

Length of head two inches, covered with scales smaller than those upon body: head slightly flattened between eyes; rounded upon occiput; somewhat depressed back of snout. *Snout* blunted, projecting two lines beyond upper jaw. *Eyes* of moderate size: their diameter equal to one half the distance between eyes. *Nostrils* directly in front of eyes: the posterior larger, situated obliquely beneath, and in front, of anterior inferior angle of eye: at the anterior inferior angle of this orifice, is situated the anterior nostril, which is very small and circular. *Mouth* of moderate size: lips fleshy: jaws filled with numerous, very small teeth: upper jaw the longer: a small fleshy cirrhus is suspended from chin. *Preoperculum* serrated at its posterior margin: more sparsely so, *beneath*. A small concealed spinous point is observed at posterior portion of *operculum*. *Lateral line* very distinct, curving with the body.

The Dorsal fin arises just back of the pectorals; its first ray is a minute spine: the second fleshy ray is much the longest of all; this ray is nearly twice as high as the length of the fin. The extremities of the rays are black.

The second Dorsal is of the color of the abdomen; of equal height throughout its entire length; one sixth less high than long. It extends to within half an inch of caudal rays.

The Pectorals are *above* black; *beneath*, color of abdomen; length less than one third their height.

The Ventrals arise in front of posterior half of pectorals; their general color like the pectorals; extremities margined with white.

The Anal fin is situated in the middle of the body; longer than high; color of abdomen.

The Caudal is lunated; a little higher than long.

The fin rays are D. 9. 26; P. 19; V. 5; A. 10; C. 17.

FAMILY IV.

SPAROIDES.

SARGUS. CUV.

Generic characters. *Trenchant incisors in front of jaws, almost similar to those of man.*

S. *ovis*. Mitchell. *The Sheep's Head.*

Trans. Lit. et Philosoph. Soc. v. i. p. 392.

This species, so elaborately described and eulogized by Mitchell, is occasionally taken in our waters south of Cape Cod. Thomas A. Greene, Esq. of New Bedford, informs me it is sometimes sold in that market. Not having met with a specimen, I copy the description of Mitchell:

"With smutty face, banded sides, pale complexion, prominent eyebrows, and grooved spinous dorsal fin. Weighs fourteen or fifteen pounds. One that weighed four pounds and a half, measured twenty inches in length, eight in depth, and three in thickness. The form of the mouth, and a certain smuttiness of the face, have a distant resemblance to the physiognomy of the sheep. Thence comes the name by which he is usually distinguished. Teeth covered by the lips which are large and distinct. Four *incisors* in each jaw, and two other teeth situated next to them, one on each side, that may be considered as *canine.* The former are straight, the latter are rather turned inwards. Within, and beyond these, two or three rows of round topped grinders, making a bony pavement as it were, inside of the mouth. No cirrhus or roughness of any kind on the head, neck or snout. Lower jaw shorter than the upper. Nostrils double. *Eyes* large, vertical, brown, and connected by a prominent brow. *Head* united to the body without any proper neck. *Gill-covers* broad and smooth; opening ample. From a scaly spot a little above the branchial aperture, proceeds a colored and curved streak to the withers. A single dorsal fin, strong and spinous, lowering into a deep furrow the greatest part of its course. The expanded tail measures six inches across, and is nearly concave, or almost lunated. A scaly process near the insertion of the ventral fin. *Lateral line* almost corresponds with the arch of the back, and radiates prettily on the scales over which it passes. General color of the sheep's head a white, or obscure silvery, with a smutty daubing over the face and chin, a greenish tinge above the brow, and six or seven dark bands or zones, of an inch or more in breadth, regularly slanting from back to belly; the latter a dull white, approaching in some places and individuals to cream color. Scales large, horny, distinguished by radiated and concentric lines, and somewhat like a square rounded a little at the corners. They are deeply inserted into the skin; adhere with remarkable firmness; and when they are separated, there is discoverable, on the edges of the skin, which enclosed them, a sort of tarnished argentine or brightish leaden hue. Rays of all the fins coarse. The pectorals are long and pointed. Tongue white and smooth.

The intestines of the individual I last dissected were lengthy, convoluted, and filled with the fragments of several sorts of *crabs.* Swimming bladder capacious and thick. Peritoneum, on opening the abdomen, blackish. Two patches of teeth in the upper part of the throat, and two smaller corresponding patches on the lower part, a short distance in front of the entrance of the gullet. But all of these are very inferior in strength and size to those of the mouth.

Rays: B. 4; V. 6; P. 6; D. 24; A. 13; C. 19."

PAGRUS. CUV.

Generic characters. *Body deep, compressed: dorsal fin single, the rays partly spinous, the posterior flexible: four or six strong conical teeth in front, supported by smaller conical teeth behind them, with two rows of rounded molar teeth on each side of both jaws.*

P. *argyrops.* Lin. *Big Porgee. Scapaug. Scup.*

Trans. Lit. et Philosph. Soc. N. Y. vol. i, p. 404.
Cuv. et Valenc. Hist. Nat. des Poiss. t. vi. p. 164.

This species, which Mitchell describes in his "*History of the Fishes of New York,*" as the "*Labrus versicolor,*" Cuvier considers the same as the

"*Sparus Argyrops.*" L. It is taken in large quantities in Buzzard's Bay and the Vineyard Sound, but has not been met with in Massachusetts Bay until within the last five or six years. At New Bedford and Holmes Hole, it is one of the most common species in the harbors, and is used more than any other fish, when fresh. At the latter place, it is taken, from the first of June until the middle of October, with the hook; after that date, in the ponds, with spears and nets. Within a few years, small numbers have appeared north of the Cape, and are now yearly captured at Wellfleet and Sandwich. Mr. Newcomb, Jr., fishmonger in Quincy market, informs me, that about six years since, a fishing smack brought from New Bedford a cargo of these fishes alive to Boston market: a portion of them were purchased by subscription among the fishermen in the market, and thrown into the harbor: the next season, two specimens were caught from our wharves: in the summer of 1835, one specimen was captured at Nahant, and was considered a *very strange fish*, no specimen having been known to have been seen there before: in the summer of 1836, Mr. Johnson, of whose kindness I have had occasion frequently to speak, sent me another specimen taken at Nahant. As no specimens had ever been taken so far north before, and as the few taken would lead to the inference that those which had been transplanted from Buzzard's Bay had not bred in the cold waters of this portion of Massachusetts Bay, we are led to believe the specimens, *taken immediately around*

Boston, were of the number of those originally brought from the south.

The length of this fish is from eight to twelve inches; length of head, one fourth the length of the entire fish; depth of body across from base of pectorals, equal to one third its length; width of body at base of tail, equal to one twelfth its length.

Body very much compressed at sides; back gibbous, gradually curving towards tail. General color, a beautiful silvery, varying with brown, reddish and blue. Abdomen white. Head destitute of scales, and of a purplish color from the commencement of the gibbosity just over the eyes, to upper and outer angle of eyes on each side, and thence within a line drawn from this part to the outer angle of jaws. *Eyes* large; irides silvery. *Lower jaw* shorter than the upper. Two rows of blunt teeth in back of jaws; those in front, sharp and prominent. *Lips* large and loose. *Nostrils* double; the anterior, smaller and circular; the posterior, larger and vertical. Preoperculum and operculum covered with scales. A large semicircular scale of a beautiful purple color, at the commencement of the lateral line: between this scale and the outer angle of the naked space, at the posterior angle of the eye, a band, half an inch or more in width, of smaller scales than those of the body, passing obliquely upwards to the anterior portion of the ridge of the back. The *lateral line*, commencing at the upper angle of the operculum and passing obliquely up to a point on a line with the fifth spine of the dorsal fin, curves with the body to the base of the tail.

The Dorsal fin, composed of twenty-four rays, twelve spinous, twelve membranous, is received into a deep groove at its base; when this fin is not erect, the spines are scarcely visible, so completely do they shut into this groove. Of the spines of the dorsal fin, the third is the longest; delicate filaments are suspended from the extremities of the first three spines. Less than two lines in front of the first dorsal spine when erect, lies a strong spine projecting forwards, almost entirely enveloped by the skin.

The Pectoral fin, one fourth the length of the body, commences on a line with the dorsal fin.

The Ventral fin with six rays.

The Anal fin shuts into a groove, like the dorsal, and, like that fin, is clouded with black spots. The three first rays of anal, spinous.

The Caudal fin forked.

The fin rays are as follows: D. 24; P. 15; V. 6; A. 15; C. 17.

Mitchell describes this species as having twenty-six rays in the dorsal fin: the specimens I have seen, had each but twenty-four.

FAMILY VII.

SCOMBEROIDES.

SCOMBER. Lin.

Generic characters. *Scales on the body small and smooth; vertical fins not bearing scales; two dorsal fins widely separated; some of the posterior rays of the second dorsal and the anal fin free, forming fin-*

lets ; sides of the tail slightly carinated ; one row of small conical teeth in each jaw ; the parts of the gill-cover without denticulations or spines ; branchiostegous rays 7.

S. *vernalis*. Mitchell. *The Spring Mackerel.*

Trans. Lit. et Philosoph. Soc. N. Y. p. 42.
Cuv. et Valenc. Hist. Nat. des Poiss. t. viii. p. 48.
Fauna Boreali-Americana, p. 80.

Mitchell describes, under the specific names of "*grex*" and "*vernalis*," the common mackerel of our coast. Cuvier, although he admits both in his great work, considers them as the same ; and Richardson remarks, "the only differences between S. *grex* and *vernalis*, seem to be in their size and color, and they are very probably different ages of the same species." I have examined with much care the mackerel which are brought to *our* market, and the differences are too slight between them to constitute distinct species.

This species is taken on our coast, from the latter part of May, in nets, in small numbers, until about the tenth of June, when it readily takes the hook, and is brought to market the remainder of the season in large quantities. Although, as fresh fish, *mackerel* are sold in the markets along our whole coast, for several months in the year, and are considered by *all*, excellent food, (from 6 to 8000 barrels being sold annually in Boston market alone,) their great value to this people, arises from the means of employment afforded to an immense number, by the process of salting and packing.

Those packed in 1836, were furnished by the following towns:

Boston, - - -	40,559 barrels.
Gloucester and Manchester,	43,937
Newburyport and Newbury,	21,463
Wellfleet, - - -	17,500
Provincetown, - -	14,139
Hingham, - - -	13,882
Cohasset, - - -	11,700
Barnstable, - - -	4,115
Scituate, - - -	3,782
Yarmouth, - - -	2,446
Salem and Beverly, -	2,394
Plymouth, - - -	1,477
Lynn, - - - -	1,400
Duxbury, - - -	1,000
Charlestown, - -	822

At the prices these fish were worth in November, 1836, the value of the year's fishing amounts to 1,264,012 dollars.

The whole number of barrels of mackerel inspected in Massachusetts for the five years, from 1832 to 1836 inclusive, are as follows:

1832,—224,000 barrels; 1833,—225,000; 1834, —253,000; 1835,—197,000; 1836,—180,616.

Although it would seem, from the above table, that a smaller quantity of mackerel had been packed in 1836, than the several years immediately preceding it, yet it cannot be inferred from this circumstance that fewer vessels were engaged, or that the business was considered less important than before.

In some years, immense shoals of these fishes are readily met with, and the vessels return in a few weeks with full cargoes; while the same localities may be visited at other seasons, and the efforts of the fisherman prove fruitless, and his fare meagre.

So peculiar are the habits of this genus, that oftentimes weeks may pass, the fishing smacks be surrounded by millions sporting upon the surface of the ocean, and scarce one allow itself to be taken, while again, the success of a few days will retrieve the disappointments of nearly a season.

Thus a fisherman informs me, that the last season, (1837) having been at the bay of Chaleur, and taken but few fish, the vessel to which he belonged, was returning home, when, off Cape Cod, the fish were so numerous and voracious, that the crew, consisting of ten men, captured, in two hours, nearly thirty barrels of them. At this time about two hundred smacks were together, and they were all equally successful, some of them taking even forty barrels of fish.

After being carefully inspected, these fish find a ready market in Philadelphia, New York, Baltimore and New Orleans, and from this last port they are sent over the entire western country. Those of inferior quality are shipped to the West India islands.

I have not been able to learn with accuracy the number of vessels engaged exclusively in this fishery; in many towns, the same vessels are used at different seasons of the year for the cod as well as the mackerel fishery. I have ascertained, however, that there were two hundred and two vessels employed in this fishery, in 1836, in the county of Barnstable, and that of this number, ninety-eight belonged to Provincetown, which were valued at $147,000.

Several of our most intelligent fishermen inform me, that the difficulty of taking mackerel is yearly increasing, from the barbarous custom prevailing of gaffing them,—of collecting them around vessels by means of throwing out bait, and then suddenly drawing up an instrument armed with numerous sharp iron points, by which many are captured, and greater numbers are cruelly maimed without being taken.

By the "Statistical Tables," drawn up by the Secretary of State, from the reports of the assessors of the different towns upon the various branches of industry, it appears, that the number of barrels of mackerel taken in the year 1837, with their prices, were as follows:—Whole number of bbls. 234,059; value, $1,639,042: taken by the following Counties:—*Barnstable Co.*, 76,036—valued at $490,638; *Essex Co.*, 69,599 = $518,663; *Suffolk Co.*, 43,266 = $320,165; *Plymouth Co.*, 25,258 = $179,748; *Norfolk Co.*, 18,450 = $120,528; *Middlesex Co.*, 1000 = $6000; *Bristol Co.*, 450 = $3300.

My description of the species is from a specimen seventeen inches in length. Upper part of the body of a dark green color, marked throughout its whole extent, from occiput to tail, with beautiful transverse, undulating bands of a deeper hue, commencing on the side of the dorsal ridge and extending below the lateral line. *Sides* white, with cupreous reflections. *Abdomen* white. The very narrow *lateral line* commences directly back of the humeral bone, on a line above the origin of the pectoral fin, and pursues a gently undulatory course to the base of the tail: this line is very distinct, being slightly prominent. Beneath the lateral line on the side, is a fuliginous line, much wider than the lateral line, which arises at the pectoral fin, and traverses the length of the fish; the space between these two lines, of a duller color than the side beneath.

Length of the entire fish to length of the head, as 17 to 3½. Top of the head, of a dark, almost black color, produced by longitudinal, broad, broken bands, passing backwards from the snout, and a large black blotch extending backwards towards the gill-covers, from the occiput. *Eyes* large, their diameter equal to three fourths the distance between the eyes; pupils black; irides silvery. Eyes protected by a nictitating membrane. The portion of head directly back of the eyes, cupreous. *Gill-covers* and maxillary bones, silvery. Intermaxillary bones dark fuliginous; angle of jaws dusky. Inferior margin of preoperculum, marked by a row of minute mucous pores. Gape of mouth, moderate. *Jaws* and palatine bones armed with a single row of very minute teeth. The whole interior of the lower jaw, and anterior portion of the upper jaw, fuliginous. *Tongue*, a dull silvery color.

The first Dorsal fin, composed of strong rays, of which, the second and third are the longest, arises on a line opposite the posterior half of the pectoral fins: the length of this fin is hardly greater than its height. When unexpanded, it is entirely concealed in a groove at its base.

The second Dorsal, situated upon the posterior half of the body, is of a fuliginous color, margined with white; its length to its height is nearly as 3 to 1; back of this second dorsal, occupying the space between it and the tail, are five finlets, the fifth, longest.

The Pectoral fins of a dark color, having beneath them a black blotch, arise back of the upper third of the operculum; their length to their height as 1 to 3.

The Ventral fins arise back of the pectorals, and likewise have beneath them a black spot at their base; save the tinge given them by this spot, they are of a flesh color. The first ray is very strong; all the rays are subdivided at their middle, and again divided into smaller portions at their extremities.

The Anal fin arises directly back of the anus, which is situated opposite the origin of the second dorsal. At the commencement of this fin, is a short spine; this fin is shorter than the second dorsal, and of the same color as the abdomen. Back of this fin are six finlets; that next the anal fin, appearing at first sight to be a portion of the fin.

At the base of the Caudal, are two longitudinal carinæ, extending the whole length of the fleshy portion of the tail: the outer rays of the caudal fin, much the longer; their articulations very obvious; fin deeply forked; extremities margined with white; distance between the extremities of the caudal rays, between three and four inches.

The fin rays are as follows: D. 10–12; P. 17; V. 5; A. 12; C. 20.

S. *colias*. Gmel. *The Spanish Mackerel.*

Cuv. et Valenc. Hist. Nat. des Poiss. t. viii. 39, pl. 209.
Yarrell's British Fishes, vol. i. 131 et pl.

This is a rare species upon our coast; some seasons they are scarcely seen at all. It is generally known by our fishermen as the "*Spanish Mackerel.*"

Length of the specimen before me, eleven inches; depth two inches. *Form elongated*, very round and plump, tapering towards the tail at the origin of which it is very small. Upper part of the body of a light green color, with numerous contiguous beautifully undulating lines of a darker green passing down the sides and just crossing the lateral line; immediately beneath the lateral line, of a dull bluish color, with indistinct circular brown blotches. *Abdomen* lighter colored, but, as well as the sides, presenting cupreous reflections. *Head*, two and a half inches in length; flattened above; compressed on the sides; rather pointed at the snout. *Eyes* large; full; pupils black; irides silvery. *Nostrils* double; the posterior, vertical, just in front of the eyes; anterior, circular, in front of the posterior, equal to the distance between the posterior and the eye: diameter of the eye, rather less than the distance between the eyes.

Superior portion of the preoperculum cupreous; inferior portion of it, as of the operculum and maxillaries, silvery. *Tongue* pointed, greenish with a metallic tint. *Jaws* equal; crowded with minute teeth.

The first Dorsal fin arises opposite the posterior third of the pectoral fins; transparent; its first ray upon its outer edge, and the spaces between the tips of the rays margined with black; the second ray longest; the tips of all slightly projecting beyond the membrane.

The second Dorsal commences back of the first, at a greater distance than the length of the first dorsal: fin shorter than preceding; rays short, covered by a thick membrane: five finlets back of the second dorsal; the fifth, deeply divided, appearing like two.

The Pectorals just beneath, and on a line with the lateral line: length about one half their height: slightly dusky: at base above, a small black blotch which is hardly perceived, unless the fin is raised.

The Ventrals, just in front of the first dorsal, elongated; reddish white.

At the origin of the Anal fin a small spine is observed. The Anal fin is opposite the second Dorsal, and, like it, has five finlets, resembling those of the back.

The Caudal fin is yellowish, deeply forked; two lateral carinæ at base.

The fin rays are as follows: D. 9–12; P. 19; V. 5; A. 13; C. 22.

THYNNUS. CUV.

Generic characters. *Form of the body like that of* *the Mackerel, but less compressed; numerous scales surrounding the thorax: first dorsal fin extending nearly to the second: second dorsal and the anal fin subdivided posteriorly, forming numerous finlets; sides of the tail decidedly curvated; a single row of small pointed teeth in each jaw; branchiostegous rays 7.*

T. *vulgaris*. Cuv. *The Common Tunny.*

Pennant's British Zoology, vol. iv. 234 et fig.
Mc Murtrie's Cuv. vol. ii. 144.
Cuv. et Valenc. Hist. Nat. des Poiss. t. viii. p. 58.
Yarrell's British Fishes, vol. i. p. 134. et fig.

This must be a very rare species in the waters of this State. I have met with only one specimen; this was taken September 4th, 1838, near Kettle Island, between Marshfield and Cape Ann, with a large sized cod-hook, baited with a "*menhaden,*" while fishing for the "*codling,*" or, as it is improperly called, "*hake.*" The Portsmouth Journal noticed another individual taken the last season, at Pigeon Cape, near Cape Ann, fifteen feet in length, and weighing about one thousand pounds. With respect to this specimen, the writer remarks; "after preparing two barrels of the fish for Boston and New York, the remainder was sold in our market, and many of our citizens were enabled to feast themselves on its most delicate meat, resembling much, in appearance, lean pork, and the best of mackerel, in taste." This species is taken in large numbers in the Mediterranean; and its flesh has been long celebrated for its delicacy. Occasionally specimens are taken upon the coast of Great Britain, upon the Cornish Coast, upon the islands west of Scotland; and it has been taken at the mouth of the Thames. That it is not every where held in the same estimation as by the Sicilians or even our Portsmouth friends, is evident from the following extracts from "*Alexander's Narrative of a Voyage of Observation among the Colonies of Western Africa,*" 1838. Visiting the Market at Funchal, the capital of Madeira, he remarks: "in the market I observed some large *tunny*, junks of which, resembling red beef, were cut up with huge knives, like small scythes, and sold for a mere trifle." On the coast of New England, this fish is called "*horse mackerel*" and "*albicore.*" It is seldom seen; never noticed in shoals, as in the Mediterranean.

The specimen I had an opportunity of examining was publicly exhibited here, and was visited by several of my scientific friends.

Entire length nine feet and three inches: two feet deep across the base of the pectorals: fifteen inches in depth across the base of the anal fin; and four inches deep at base of the caudal fin. Form elongated; gradually sloping from the beginning of the dorsal to the snout, and tapering from the dorsal to the tail. Color of the whole upper part nearly black: sides silvery: beneath white. Scales on the back, in front of the first dorsal, at base of, and beneath the pectorals, very large.

Length of the head, two feet three inches; jaws equal when closed; tongue large, broad, black; all inside of the mouth dark colored; gape of the mouth very large; eyes circular; pupils black; irides golden, with greenish reflections: distance between the eyes, one foot. Gill-covers, very large, perfectly smooth, of a silvery gray color.

The first Dorsal fin commences two feet three inches back of the tip of the snout; its rays are very strong; the first ray nine inches long; they gradually diminish in length; the last being scarcely perceptible. The rays are of a fuliginous color; while the connecting membrane is nearly black. This fin shuts entirely into a groove, which, at its origin, is one and a half inches deep; when the fin is unexpanded, it is perfectly invisible.

The second Dorsal is of a reddish brown color; twelve inches in height; five in length: this fin resembles a very strong membrane, similar to the fins of the Sharks, it being almost impossible to count the rays: nine finlets between this and the tail, of a bright yellow color, dark at base, and upon the anterior edge.

The Pectoral fins are falciform; of the same color as the gill-covers; five inches long; sixteen inches high.

The Ventral fins are composed of very strong rays, situated in a groove at their base, just beneath the pectorals; above, black; beneath, white; eleven inches high; two inches long.

The Anal fin commences six inches back of the second dorsal; and is similar in appearance to that fin: the rays cannot be counted on account of their compactness: fin fifteen inches high; five inches long: nine finlets, color of the dorsal; and, like them, the middle longest.

The Caudal fin is lunated: seven inches high in its middle; measuring two feet five inches across its extremities. At its base, a lateral carina, which is continued on to the tail, seven inches long; one and a half inches high. On each side of the portion of it which is upon the tail, two smaller carinæ are situated three inches in length, between which and the former, depressions are thus produced.

The fin rays, so far as could be counted, are about as follows: D. 14–13; 9 finlets; P. 34; V. 1–5; A. 2–12; 9 finlets; C. 19.

PELAMYS. CUV.

Generic characters. *Distinguished from the Tunnies solely by their separate, pointed, and strong teeth.*

P. *sarda.* Bloch. *The Skip Jack.*

Trans. Lit. et Philosoph. Soc. N. Y. 428.
Cuv. et Valenc. Hist Nat. des Poiss. t. viii. p. 149, pl. 217.

This species is by our fishermen incorrectly called "*Bonito.*" The true "*Bonito*" is a "Thynnus," Cuv. I have examined two fine specimens of this fish; one, nineteen inches long, was sent me by Dr. Yale, from Holmes Hole. He informs me, that for the last six or eight years, this species has been frequently met with at the Vineyard, and is readily taken with trailing bait. The second specimen I have seen, measured twenty-one inches in length. It is at once distinguished from any other of the family in our waters, by its ash-colored abdomen; dull greenish back, and oblique and transverse dark bands.

From the latter specimen, I draw up the following description: color of the head and upper part of the body, a greenish brown: sides, lighter; abdomen, silvery white. Body smooth; a broad oblique patch of minute scales is observed just above the pectoral fins, commencing at the posterior extremity, and widening towards the occiput: minute scales situated along the sides of the dorsal ridge, looking like small papillæ longitudinally arrayed. Ten or twelve dark colored bands pass obliquely downwards and forwards from the dorsum towards the abdomen: the first of these bands commence at the posterior extremity of the dorsal fin; the last, at the origin of the caudal fin. Some of these bands pass very low down upon the sides, even to the abdomen. Besides these, several indistinct lighter colored bands cross the body transversely. *Lateral line* arises high up on the back, and pursues a pretty undulatory course, until about on a line with the anal, from whence it goes straight to the caudal fin. Length of the head, four inches and three quarters: top of the head, dark greenish brown: gill-covers silvery, marked with fuliginous. Gape of the mouth large. Tip of the upper jaw scarcely projecting beyond the lower: jaws and palatine bones with a single row each of sharp, recurved, prominent teeth: upon the middle of the lower jaw are four teeth; the anterior two quite small; the posterior, the largest in the jaws: the palatine bones are very small. Diameter of the eye equal to one third the distance between the eyes; pupils black; irides, silvery.

The first Dorsal fin commences on a line just back of the posterior angle of the operculum; its second ray is highest; color of the fin light, with dull patches; the posterior short rays almost concealed in a groove upon the back, when unexpanded.

The second Dorsal is longer than high; back of this fin are eight finlets, the third and fourth of which are longest.

The Pectoral fins arise just in front of the first dorsal, of a dark color above, lighter beneath; as high again as long.

The Ventrals commence back of the pectorals; are darker colored next to the abdomen. When unexpanded, these fins shut into a depression, partially formed upon the abdomen.

The Anal fin arises on a line opposite the first dorsal finlet; is a little longer than high, white, with fuliginous. Back of the anal, are seven finlets; the posterior, smaller. Anus small, directly in front of the anal fin. A thick, fleshy carina on each side of the fleshy portion of the tail; on each side of the posterior part of this, two quite small, obtuse carinæ run directly back across the middle of the caudal fin, causing quite a depression between them.

The Caudal fin lunated, of a dirty bluish color; length of the exterior rays, compared to distance between the extremities when expanded, as 3 to 5½.

The fin rays are as follows: D. 20–14; P. 24; V. 6; A. 14; C. 24.

XIPHIAS. Lin.

Generic characters. *Body fusiform, covered with minute scales; a single elongated dorsal fin; ventral fins wanting; tail strongly carinated; upper jaw elongated, forming a sword; mouth without teeth; branchiostegous rays 7.*

X. *gladius.* Lin. *The Sword Fish.*
Pennant's British Zoology, vol. iii. 141.
Strack's plates, 21. 1.
Mc Murtrie's Cuv. ii. 148.
Cuv. et Valenc. Hist. Nat. des Poiss. t. viii. p. 255.
Yarrell's British Fishes, vol. i. 143.

Although this species is not included by Richardson, in his "Fauna," on account of its presence on the American coast not having been ascertained with certainty by those who had referred to it, it is frequently met with in our waters, and is becoming quite an article of commerce with us. It is generally discovered by the projection of its dorsal fin above the surface of the water, as it is pursuing shoals of mackerel, upon which it feeds, about 15 or 20 miles from the shore of Martha's Vineyard. The fishermen capture it by means of an instrument called a "*lily iron,*" from the form of its shafts or wings, which resemble the leaves of a lily. This instrument is thrown, like a harpoon, with great force into the fish, the attempt always being made to wound the animal in front of the origin of the dorsal fin. When wounded, it sometimes frees itself from the iron by its struggles, and has been known to dive with so much force towards the bottom of the sea, as to drive its sword throughout its whole extent into the sand or mud, which was proved by its appearance when taken. When unmolested, it not unfrequently is observed to spring several times its length forwards, several feet above the surface of the water.

The flesh of this fish when salted is eaten, and preferred by many to that of several other species. The *cod-fishers* at Noman's Land, being disappointed the last season in their usual avocation, directed their attention to the taking of the *sword fish,* and were quite successful in their efforts. About 200 barrels are annually taken at Martha's Vineyard, which are either sold fresh, or cut into slices and pickled or salted, and kept for sale in that state throughout the year. It sells for from three to four cents per pound.

From a specimen kindly sent me by Dr. Yale, which was taken August 29, 1838, between Gay Head and Block Island, by Mr. Warren Cleaveland, I have drawn the following description:

Back and upper part of the sides, of a sky-blue color; beneath, silvery gray. Surface smooth. Entire length, twelve feet five inches; depth across, from the origin of the anal fin, fifteen inches. Length of the head, from the posterior edge of the operculum to the point of the lower jaw, twenty-two inches; length of the upper jaw or sword, beyond the point of the lower jaw, three feet five inches. Jaws without teeth. Gill-covers silvery brown. Upper part of the sword, dark brown, almost black, having a dorsal ridge, within which is a groove. Under portion of the sword, lighter colored, smooth, with a velvety feel. The two anterior feet of the sword have a bony, perfectly smooth edge. Widest portion of the upper jaw, five and a half inches; jaw gradually terminates in a point. *Eyes* very moveable in their orbits, three and a half inches in diameter; distance between the eyes, eight inches. Branchiæ composed of four pairs of large parallel laminæ, and one smaller one.

The Dorsal fin commences nearly on a line with the posterior edge of the operculum. It is strongly falciform; twenty-two inches high, eighteen inches long. But eighteen rays are obvious; the whole dorsal ridge between them and within six inches of the base of the tail, destitute of fin rays; and in their place, a shallow groove the whole extent, supporting a slight membranous elevation. Six inches in front of the base of the tail, a small fin four inches high, one inch long, composed of three rays, looking like the adipose fin of the "*Salmonides*," or the finlets of many of the "*Scomberoides*."

The Pectoral fin, also, is falciform, eighteen inches high, six inches long; above, almost black; beneath, color of the abdomen.

The Anal fin is, like the preceding, falciform; sixteen inches high, ten inches long. The extremity of this fin terminates on a plane with the termination of the dorsal, and is formed like that. This small portion is three inches high, and one long. Fin, color of the abdomen.

At the base of the tail, a transverse furrow three inches long and two thirds of an inch wide. On each side of the base of the tail, a lateral carina three inches high, eight inches long, three inches back of the dorsal, extending three inches on the caudal fin.

The Caudal fin deeply forked; twenty-nine inches high, eight inches long, six inches high in its middle.

The fin rays are as follows: D. 18–3; P. 15; A. 11–3; C. 17.

The common size of this fish is from 12 to 15 feet in length, and weighing from 300 to 400 pounds, although it sometimes is taken considerably larger.

Although a species of "*Xiphias*" has been known for many years to frequent our coast, I am not aware that it has been examined by any of our scientific men, save by my friend John B. S. Jackson, M. D. of this city, who kindly loaned me his rough notes of a specimen exhibited here in 1833. From these notes it appears, that the "specimen was taken by codfishers, from a small dory, about twenty miles from Boston, not far from Marshfield, and near the Western Banks. It was drawn up with much difficulty with cod hook and line, and then speared. Whole length, 11 feet 4 inches. Length of sword, 4 feet. Weight, 650 pounds."

In looking over the plates of this fish, one is surprised at the great dissimilarities between them; and could he think that each plate had been drawn from a recent specimen, he would be compelled to conclude there must be more than one species. But, as in many other instances, they are probably poor copies of each other; those points only being particularly attended to, which seem to the copier most important. In Pennant's "British Zoology," the whole interval between the commencement and extremity of the dorsal fin is occupied by an immense number of minute rudiments distinct from each other. While the figure of Strack exhibits but seventeen prominent rays between the extremities, connected by a membrane. The anal also, differs much in the two figures. In the specimen I have just described, it will be remembered that not the slightest rudiment of a ray was distinguishable upon the dorsal ridge back of the eighteenth ray, until within six inches of the base of the tail. Yarrell figures a young specimen, showing that there is but one dorsal fin, which occupies the whole length of the back, from the gill-covers to within a short distance of the tail. If the reason offered by Cuvier for the disappearance of the greater portion of the dorsal fin be true, viz., "the middle of it being worn with age, gives it the appearance of being double,"—and of Yarrell, "but the portion of the fin intermediate between the two ends is so slight that it is easily torn, or even entirely worn away by use during life,"—if this explanation be correct, it is not a little singular, that the appearance of the entire dorsal ridge should, in my specimen, have been so uniform: *no rays partially worn or broken in the interval between the extremities*, as we should suppose would be produced by a gradual change, but ***an entire absence of rays***, from the eighteenth, which is perfect, to the posterior rays, which are also all perfect.

Yarrell observes, that the edges of the sword are "finely denticulated." In that portion of the edge of the sword before me which is perfect, it is *entirely smooth;* the greater portion of the edge is broken at intervals irregularly, unnaturally, evidently by use.

TRACHINOTUS. Lacepede.

Generic characters. ***Free spines on the back, and two others, also free, before the anal; body elevated, and the tail without the lateral carinæ; profile vertical; and the dorsal and anal fins tapering to points more or less long.***

T. *argenteus.* Cuv. *The Rudder Fish.*

Cuv. et Valenc. Hist. Nat. des Poiss. t. viii. p. 413.

Dr. Yale sent me from Holmes Hole, three specimens of a fish, generally known at the Vineyard by the name of "*rudder fish*," which, after considerable hesitation, I have concluded to be the "T. *argenteus*," Cuv. The smallest specimen, two inches in length, answers perfectly to the figure, in Mitchell's "Fishes of New York," incorrectly called by him "*Coryphæna hippurus.*" This small specimen was taken at a wharf at Holmes Hole. The two large specimens were caught about fifteen miles from land. Dr. Yale writes me, that "this fish is generally found at sea, but is common in our waters.

It follows vessels, or keeps near old casks or planks that are floating, and sometimes is found about the wharf logs in our harbor."

Of the specimens lying before me, the largest is eight inches in length. *Body* oblong, compressed upon the sides; back arching abruptly over the eyes; of a bluish white upon the sides, looking as if covered with black dots, owing to the dark outline of the scales; body beneath, of a dull white color. (In the smallest specimen, which must be quite a young fish, the color is a dark brown, variegated with yellow patches.) *Head*, one fourth the length of the body; diameter of the eye, one fourth the length of the head. A bony ridge over the eyes. Operculum large, naked, of a horny texture, margined by a membrane. Preoperculum strongly serrated throughout. A depression upon the top of the head, between the eyes; distance between the eyes, rather greater than diameter of the eye. *Nostrils* directly in front of the eyes; the posterior, much the larger. The upper jaw at the snout descends abruptly; jaws of equal length, with small, sharp teeth. The *lateral line* commences high above the operculum, and curving over the pectorals to their extremities, pursues a straight course to the tail.

The Dorsal fin commences back of a line opposite the posterior angle of the operculum, and is continued to fleshy portion of the tail. Seven spines precede the fleshy rays of the dorsal; the posterior is connected, throughout almost its entire height, to the membrane of the dorsal; the preceding ones are nearly free, or rather have a membrane attached to their lower portion, but which does not pass high up the spines.

The Pectorals are beneath the posterior angle of the operculum; less than one third as long as high, of a dark brown color.

The Ventrals are one fourth of an inch long; their outer ray, spinous.

The Anal fin arises just in the middle of the body, and is nearly as long again as high; color of the dorsal. This fin is preceded by three spinous rays, the first of which is free.

The Caudal fin is quite deeply lunated.

The fin rays are as follows: D. 5. 2–22; P. 19; V. 1–5; A. 1. 2–17; C. 20.

Although there are three spines before the anal, but *one* of these can be said to be free; of the remaining two, the second is more free than that next the fin.

TEMNODON. CUV.

Generic characters. *Tail unarmed; a small fin, or free spines before the anal; the first dorsal is very slight and low, the second and the anal covered with small scales; but their principal character consists in a range of separate, pointed and trenchant teeth in each jaw; behind these, above, is a row of small ones, and the vomer, palatine and tongue are furnished with others, very small and crowded. The operculum terminates in two points, and there are seven rays in the branchiæ.*

T. *saltator*. Cuv. *The Blue Fish.*

Trans. Lit. et Philosoph. Soc. N. Y. p. 424, et fig.
Cuv. et Valenc. Hist. Nat. des. Poiss, t. ix. p. 231.

This species described by Dr. Mitchell as the "*Scomber plumbeus*," and called the "*horse mackerel*" by the vulgar, is better known in those portions of our state where it is taken, as the "*blue fish*." Many years since it was held in high estimation by the aborigines of our country. For about fifty years it disappeared from our coast, as may be learned from the following passages, extracted from a journal of the first settlement of the island of Nantucket, written by Zaccheus Macy, in 1792, and contained in the third volume of the "Massachusetts Historical Collections." In this account, notice is taken of a great pestilence which attacked the Indians of that Island in 1763 and 1764, with such mortality, that of the whole number 358, 222 died. He adds: "Before this period, and from the first coming of the English to Nantucket, a large fat fish called the *blue fish*, twenty of which would fill a barrel, was caught in great plenty all round the island, from the 1st of the 6th till the middle of the 9th month. But it is remarkable that in the year 1764, the very year in which the sickness ended, they all disappeared, and that none have been taken since." Occasionally, for the last twenty years, a few straggling specimens, very small, have been taken, but they were rarely seen until within the last ten years; during this latter period they have gradually increased in number, and, generally speaking, have been of a much larger size than when they were first observed. Now, they visit the coast south of Cape Cod, at Nantucket, and New Bedford, and Holmes Hole, in large numbers, and are occasionally captured weighing fourteen pounds. They are caught from shore by throwing a drail—a hook fixed into a piece of bone or ivory, and sometimes pewter, something in the form of a fish, with brass wire around the line next it, to prevent its being bitten off by the strong jaws of the fish; they are also caught in a boat under sail with a good breeze, the line dragging behind; and they have been taken with a seine; thus in a number of the Nantucket Enquirer, July 8th, 1837, I find the following: "a few days since, there were caught at one haul, 241 blue fish, 108 scuppaugs or poggies, 28 basse and 19 shad, in all 396 fish, weighing about half a ton." On the 25th October, 1837, a specimen of this species, weighing about three pounds, was taken at Green Island by Mr. Morgan, of that place, and sent to Mr. Newcomb, Jr. of Quincy Market; this is the only specimen I have known to be taken in Massachusetts Bay. In its flavor, this fish resembles the mackerel, and is highly esteemed by many as an article of food; but it is excessively fat, and cannot always be borne by the stomach. In the early part of summer it is very lean; towards the latter part of summer and the commencement of autumn, it is in a state of perfection for the epicure. By the kind attentions of the Hon. Hezekiah Barnard, of Nantucket; George B. Emerson, Esq., President of the Boston Society of

Natural History; and Dr. Yale, I have had an opportunity of examining several specimens. To the first of these gentlemen, I am indebted for much of the information obtained respecting this species.

The following description, I have drawn up from a specimen fifteen inches in length. Depth of the body across, on a line with the base of the pectorals, three inches. Length of head, three inches six lines. All upper part of the body is of a bluish color; lower part of the sides, as well as of the abdomen, whitish. A large black spot at the base of the pectoral fins. Head above, naked. *Nostrils* double, terminating in the same cavity; the anterior orifice circular, and situated directly in front of the posterior, which is larger and placed horizontally. *Jaws* with prominent, sharp, lancinated teeth; the lower jaw has but one row of these; the upper, besides a similar row with the under jaw, has a row of very small teeth, back of these. A row of very minute teeth at the base of the tongue; also small teeth upon the vomer and palatine bones. *Eye*, five lines in diameter; irides yellowish. Operculum terminated in two points, which do not amount to spines. The *lateral line* commences just above the posterior angle of the operculum, and curving with the body, terminates at the base of the rays of the caudal fin. Fins covered with scales.

The first Dorsal fin is composed of seven spinous rays; these, when not erect, are received into a groove at their base.

The Anus is half an inch in front of the anal fin.

Width of the tail when expanded, is more than five inches.

The fin rays are as follows: B. 7; D. 7–26; P. 17; V. 6; A. 28; C. 19.

PEPRILUS. CUV.

Generic characters. *Form compressed; small and slightly apparent scales under a satiny epidermis; snout obtuse and non-protractile; a single dorsal fin, preceded, as well as the anal, by a horizontal, partially concealed spine. The pelvis forms a trenchant and pointed blade, before the anus, that might be taken for a vestige of ventrals. Besides the ordinary lateral line, there is a stria on the flank, which has been considered as a second one.*

P. *triacanthus*. Peck. *The Three-Spined Peprilus.*

Memoirs of the American Academy of Arts and Sciences, v. ii. p. 48, et fig.
Mitchell, Trans. Lit. et Philosoph. Soc. N. York, p. 365, et fig.
Cuv. et Valenc. Hist. Nat. des Poiss.

In 1794, Peck read a description of this fish, which he accompanied with a very fair figure, to the "American Academy," under the name of "*Stromateus triacanthus.*" This paper was published in the year 1804. In 1814, Dr. Mitchell read his paper upon the "Fishes of New York," to the "Literary and Philosophical Society" of that state, and the next year this paper was published in that society's Transactions: in his paper, he describes the species under consideration, with the specific name of "*cryptosus.*" Mitchell's name is retained by Cuvier in the Notes to his "Regne Animal." Dr. Mitchell would never thus have neglected Peck had he been aware of the existence of his paper. Our duty is clear; and we cheerfully prefix the name given it by its first describer: his description is very accurate, and his name is equally appropriate.

This species is not uncommon in our waters: it is generally taken in nets, and is considerably used as bait for the "*striped basse*" by our fishermen: being a very oily fish, it is found serviceable as manure, for which purpose it is used upon some portions of Cape Cod. I have known a single specimen to be taken from one of the wharves in this city.

From a specimen before me nine and a half inches long, and three inches deep across from the anus, I make the following description. *Body* ovate, very much compressed; being more so towards the tail. Of a lead color upon the back; lighter on the sides; silvery upon the abdomen. Length of the head two inches, gradually arched from the snout above: arch of the back continued to the spine at the origin of the dorsal fin. *Eyes* circular, one half inch in diameter; pupils black; irides silvery. *Nostrils* small, three lines in front of the eyes; anterior, circular; posterior, a vertical fissure. *Mouth* moderate in size; jaws equal in length, at their edges presenting a large number of very minute, equal, compact serrations or teeth; tongue, spotted with brown. *Gill-covers* silvery, with cupreous reflections. The *lateral line* which is very well marked, commences just back of the posterior angle of the operculum, and, arching backwards, curves with the back to the upper part of the fleshy portion of the tail. A slight, depressed, straight line, destitute of scales, is seen passing from the origin of the lateral line to the middle of the fleshy portion of tail; and another line, similar in its appearance to the last, passes from the inferior base of the pectorals, curving with the abdomen to the lower part of the fleshy portion of the tail, corresponding in its course with the lateral line. These lines gradually disappear after death. At the side of the dorsal fin, commencing at its origin, and terminating towards its posterior half, are situated between twenty and thirty small circular black punctures, which give it a very characteristic appearance: these orifices are mucous ducts. At the origin of the dorsal fin a small naked horizontal spine points forwards.

The Dorsal fin, of the same color as the sides of the body, commences half of an inch back of the pectorals, and is continued to the fleshy portion of the tail: the rays, posterior to the eleven first, are considerably shorter, and are continued to the extremity, of about equal length.

The Pectorals are slightly lighter than the dorsal: length to height as 3 to 19.

The Anus is a small fissure just in front of the anal spine. Three lines in front of the anus, is a small horizontal spine pointing backwards, the posterior point of the pelvis.

The Anal fin has, at its origin, a horizontal naked spine also, pointing forwards like that before the dorsal: this fin arises just back of a line opposite the origin of the dorsal, and terminates upon the same plane with it: it is formed like the dorsal, but is not so high.

The Caudal fin is of the color of the pectorals, and is deeply forked: height of the rays two and a half inches: length of the fin, one half inch; depth of fins, when the extremities are expanded, two inches.

The fin rays are as follows: D. 45; P. 21; A. 43; C. 20.

FAMILY XI.

MUGILOIDES.

ATHERINA. Lin.

Generic characters. *Body rather elongated; two dorsal fins widely separated; ventral fins placed far behind the pectorals; sides with a broad, longitudinal, silver band; teeth minute; branchiostegous rays,* 6.

A. *Boscii.* Cuv. *The small Silver Side.*

Trans. Lit. et Philosoph. Soc. N. Y. 1. 446, et fig.
Cuv. et Valenc. His. Nat. des Poiss. t. x. p. 465.

The several species of foreign Atherinæ, are known by the names "*Atherine,*" "*Sand Smelts,*" and "*Anchovies,*" and are much valued as articles of food. This species was described by Mitchell, in his "Fishes of New York," under the name of "*notata.*" I have seen but two specimens: one, was sent me from Holmes Hole, by Dr. Yale; the other was found by Dr. Gould, at Provincetown.

The specimen lying upon my table, is four inches in length: its greatest depth is one inch and a half. Body elongated, of a reddish brown color, with a broad silvery band arising at the base of the pectorals, and continued to the caudal rays. Length of the head five lines, flattened on its top. *Eyes* circular, one line in diameter; pupils black, irides golden; distance between the eyes rather more than one line. *Jaws* equal in length, armed with very small teeth; gill-covers golden.

The first Dorsal fin arises six lines back of the pectorals.

The second Dorsal is lighter colored than the body, and distant three lines from the first dorsal.

The Pectorals commence directly back of the upper part of the operculum; length less than one third of the height; color, of the back; upper rays double the length of the lower.

The Ventrals arise on a line with the posterior extremities of the pectorals, and are five-rayed.

The Anal fin is situated just back of the origin of the second dorsal; as long again as high.

The Caudal fin is quite deeply forked; lighter colored than the other rays.

The fin rays are as follows: D. 4–9; P. 12; V. 5; A. 25; C. 17.

FAMILY XII.
GOBIOIDES.

PHOLIS. Artedi.

Generic characters. *Long, equal, and closely set teeth, forming but a single and regular range in each jaw, terminated behind, in some species, by a longer and hooked tooth. The head is obtuse, the muzzle short, and the forehead vertical; the intestines broad and short.*

P. *subbifurcatus.* Nobis. *The subbifurcated pholis.*

I have seen but a single specimen of this fish; it was found at an unusually low tide among the sea-weed at Nahant, and brought to me by my brother-in-law, Thomas M. Brewer, M. D.

Specific characters. *Dorsal fin extending to the tail; filaments upon the nostrils; three dark colored bands passing from the eyes; lateral line subbifurcated.*

Length, including the tail, five inches five lines; depth across, on a line with the anus, one inch; body much compressed. General color of the body, reddish brown; several lighter colored circular patches along its upper part, at the base of the dorsal fin; the spaces between the rings darker than the rest of the body, giving the appearance of bars. Body beneath the lateral line, lighter colored; abdomen yellowish white. Body smooth, scales very minute. Length of the head, from the tip of the snout to the posterior angle of the operculum, is to the whole length of the body as 1 to 3; above, brownish; operculum and preoperculum yellow; entire surface destitute of scales; jaws somewhat protractile, armed with prominent, sharp teeth; lips large and fleshy; over the nostrils a minute filament one third of a line in length; circumference of the eye, two lines; from beneath the eye, a broad black band, wider at its base, crosses obliquely the operculum; two other bands of the same color extend from behind the eye backwards, in nearly a straight line, the distance of from one to two lines. The *lateral line* commences just above the angle of the operculum, and, having extended two lines, subbifurcates; passing down in a gradual curve a little more than a line, it is continued in a straight course to the base of the caudal fin; while the upper portion abruptly terminates opposite the fourteenth ray of the dorsal fin.

The Dorsal fin, commencing on a line with the posterior angle of the operculum, is continued to the caudal fin; the first five rays of this fin are shorter than the sixth; the rays become again shorter as they approach the tail; numerous black spots upon this fin: those larger upon the first five rays.

The Pectorals, three lines long, of a light color, with some darker shades, are rounded; they arise on a line with the posterior angle of the operculum, and also the commencement of the dorsal fin.

The Ventrals are situated two lines in front of the pectorals; the rays are united throughout the greater portion of their extent; extremities free.

Anus situated two and a half inches from the extremity of the jaws.

The Anal fin commences just half way between the tip of the snout and the extremity of the tail; its edge is dark colored.

The Caudal fin is rounded: small dark-colored spots upon this fin, as well as upon the pectorals.

The number of fin rays as follows: D. 43; P. 13; V. 3; A. 30; C. 14.

MURAENOIDES. Lacepede.

Generic characters. *Head small, muzzle obtuse; body elongated, smooth, scales minute, covered with a mucous secretion; dorsal fin extending the whole length of the back, the rays simple; ventral fins very small; teeth small, pointed, detached.*

M. *guttata.* Lacepede. *The spotted Gunnel.*

Pennant's British Zoology, vol. iv. p. 183.
Mc Murtrie's Cuv. vol. ii. p. 176.
Yarrell's British Fishes, vol. i, p. 239, et fig.

This pretty little species, which is also called abroad the "*butter fish,*" from the slime with which it is covered, is found at low tide upon the beaches, beneath stones and sea-weed; it is exceedingly difficult to retain in the hand after it is captured, on account of its slipperiness and agility. It is common at Nahant, Holmes Hole, and probably along our entire sea-coast. I have found it in the stomach of the "*Anarrhicas lupus,*" and "*Cottus Vir-*

ginianus," and it is undoubtedly eaten by many other fishes.

This fish is sometimes met with, twelve inches in length. It is of a yellowish brown color, presenting a waved appearance, with twelve or more ocellated black spots along the base of the dorsal fin, surrounded with a lighter circle. The *lateral line* pursues a straight course. Length of the head, to the whole length of the body, as 1 to 5. *Eyes* small; pupils black; irides bluish, with a beautiful red ring within. *Mouth* oblique when the jaws are closed. Minute sharp teeth in each jaw. Back of the angle of the mouth, a brown band descends from the eyes to the throat.

The Dorsal fin, which is but slightly raised above the back, commences on a line above the posterior angle of the operculum, and is continued to the tail, being composed of spinous rays entirely concealed, save their points, by the membrane.

The Pectoral fins are reddish, arising back of the posterior inferior angle of the gill-covers.

The Ventrals are very small, situated in front of the pectorals; their outer rays spinous.

The first two rays of the Anal fin are spinous.

All the fins rather lighter colored than the body of the fish.

The fin rays are as follows: D. 76; P. 11; V. 1–1; A. 42; C. 15.

This fish is said to be eaten by the Greenlanders, but I have never heard of its being used for food in New England.

ZOARCUS. CUV.

Generic characters. *Body elongated, covered with a mucous secretion; head smooth, muzzle blunt; ventral fins situated before the pectorals; dorsal, anal and caudal fins united; all the fins very thick; vent anterior to the middle of the body, its situation marked by a tubercle; teeth conical, placed in a single row; branchiostegous rays* 6.

Z. *anguillaris*. Peck. *The eel-shaped Blenny.*

Memoirs American Academy, vol. ii. et fig.
Trans. Lit. et Philosoph. Soc. N. Y. vol. i. p. 375, et fig.
Mc Murtrie's Cuv. vol. iii. p. 177.

Although Dr. Mitchell called this species "*labrosus*," in his paper on the "*Fishes of New York*," read before the "*Literary and Philosophical Society of New York*," in 1814, and Cuvier has retained this specific name in his "*Regne Animal*," still, as Peck, in 1794, wrote a good description of this fish under the name of "*Blennius anguillaris*," and published his account, accompanied by a very respectable figure, in the 2d part of the 2d volume of the "*Memoirs of the American Academy of Arts and Sciences*," in 1804, I should be doing injustice to the memory of a distinguished naturalist, were I not so regardful of his honor as to acknowledge the priority of his description, and to attempt the establishment of his specific name.

This species, which is incorrectly called by our fishermen the "*ling*," sometimes attains the size of three and a half feet. It is seldom met with in Boston market. When young, its flesh is very sweet and palatable; I have repeatedly had it upon my table.

I improve the opportunity presented by the possession of a fine specimen, taken at Provincetown, thirty-one inches in length, to draw up the following description:

Color, a yellowish brown or fawn, sprinkled with darker patches; beneath, paler; the front and top of the head, of a livid color; the gill-covers lighter, but rather dull, having a distinct dirty white band nearly two lines in width, running obliquely from the under and outer angle of the eye to the posterior edge of the operculum. Whole surface of the fish, with the exception of the head, covered with innumerable minute cup-like depressions. *Head,* large, resembling in its aspect that of a "*Cottus*"*;* body gradually tapering, and terminating in a pointed tail. Length of the head to the whole length of the body as 1 to 5; width of the back of the head, greater than the greatest depth of the body. Upper lip projecting beyond the lower, very large and fleshy; projecting over the jaw nearly two thirds of an inch: under lip also quite fleshy, but much less so than the upper. *Teeth* in the jaws, large; those situated in the back of the jaw, sharper; a single row from the outer angle of the upper jaw the extent of four teeth; then a double row of three teeth; then, to the middle of the jaw, a row of three teeth deep; the front teeth of this triple row are the largest in the jaw. A single row of eight teeth from the outer angle of the lower jaw towards the middle; then a double row of from four to six teeth to the middle of the jaw. Numerous large teeth in the throat; tongue large, fleshy, smooth. *Nostrils* tubular, about half the distance between the eyes and the snout; the distance between the eyes, equal to about one sixth the length of the head. Pupils of the eye black; irides golden. The *lateral line* commences above the operculum, at a distance in front of its posterior angle, equal to the distance between the eyes, and passing just beyond the posterior angle of the operculum, makes a slight curve downwards, and then passes on towards the posterior extremity of the body, in a straight course; a portion of this line is scarcely visible. All the fins are enveloped in a fleshy membrane.

The Dorsal fin, commencing on the same plane with the ventrals, is continued to the tail; previous to reaching the tail, however, about seventeen of its rays lose their fleshy portion, and exhibit only their spinous bases. At the termination of these spinous rays, commences the tail.

The Pectorals are broad, round at their extremities, and of a yellow color, inclining to brown at their base.

The Ventrals are situated in front of the pectorals, composed of two rays, but, being enveloped by a tough membrane, appear as if but one.

Anus large, situated just in front of the anal fin.

The rays of the Anal and Caudal fins cannot be distinguished from each other. About one hundred rays can be counted of the anal fin, but the rays of the fleshy tail cannot be distinguished. Both dorsal and anal fins are of a greenish color, tinged with yellow.

The fin rays, as far as could be counted, are as follows: B. 6; D. 120; P. 19; V. 2; A. 100.

In a living specimen of this species, received March 27, 1838, twenty-one inches in length, the color was a light salmon, mottled with irregular olive-colored blotches, darker towards the head. *Head* lighter colored than in larger specimens; the two oblique bands on the operculum, narrow and rather indistinct. In the upper jaw, the row of single teeth is six in number; in the lower jaw, the single row contains six also. Irides salmon colored. A considerable number of mucous glands quite obvious upon the head, back of, and beneath the eyes. The *lateral line* is more perceptible than in the mature specimen. Body beneath, white; neck, flesh colored.

The Dorsal fin almost white, salmon colored at its edge.

The Pectorals of a true salmon color, lighter at their origin.

The Ventrals, salmon colored.

The Anal is salmon colored at its edge, flesh colored at its base, with seven distinct white blotches in its extent.

The dorsal, pectoral and anal fins are perfectly transparent.

In the stomach of this fish I found specimens of the following shells, viz.: *Buccinum undatum*, *Fusus corneus*, and *pleurotomarius*; *Turbo inflatus*, *Natica triseriata*, and *consolidata ; Bulla tritacea*, and *Tellina sordida.*

ANARRHICHAS. Lin.

Generic characters. *Head smooth, rounded in form, muzzle obtuse ; body elongated, covered with minute scales ; dorsal and anal fins long, distinct from the caudal ; no ventral fins : teeth of two kinds ; those in front elongated, curved, pointed ; the others on the vomer, as also on the jaws, truncated, or slightly rounded : branchiostegous rays* 6.

A. *lupus.* L. *The Wolf Fish. Cat Fish.*

Pennant's British Zoology, vol. iii. p. 133, et fig.
Strack's plates, 21, fig. 2.
Mc Murtrie's Cuv. vol. ii. p. 177.
Yarrell's British Fishes, vol. i., p. 247, et fig.
Richardson's Fauna, p. 95.

This ferocious species is captured about rocky ledges at all seasons of the year, although greater numbers are taken in winter than at any other time. The *cusk rocks*, between Boston and Cape Ann, are a favorite resort of this fish. Its hideous appearance renders it an object of such disgust, that it is not unfrequently thrown away as soon as caught. By many of our fishermen, however, it is regarded as excellent food, and thought to be scarcely inferior to that of any of our fishes; specimens weighing from five to ten pounds are very delicate when fried or boiled. I have had this fish upon my table: few fish are superior to it when broiled.

My description is drawn up from a specimen three feet in length, weighing fifteen pounds. Entire body covered with a slimy secretion. Color, a purplish brown, with transverse nearly black bars, passing from the abdomen high up on the dorsal fin; beneath, lighter. *Head* large, flattened on the top, blunt at the snout. Length of the head to the entire length of the body, as 10 to 36; depth of the head, nearly equal to its length. *Eyes* moderate in size; irides yellow; distance between the eyes equal to one fifth the length of the head. *Jaws* equal, armed with long, strong, pointed teeth; in the back part of the lower jaw, these teeth are very large and blunted tubercles; on each side of the roof of the mouth, teeth are large and prominent; in the middle of the roof a double ridge of tubercles similar to, but larger than those on the jaws, extending some distance back, looking like single teeth divided in their centre. *Tongue* large, fleshy, fuliginous. Lips loose, fleshy.

The Dorsal fin, which is about the same height throughout its whole extent, arises on a line with the base of the pectorals, and extends near to the tail, appearing as if almost united to it, by the prolongation of the membrane of the fin.

The length of the Pectorals to their height as 3 to 5; rays very large; when expanded, these fins are rounded in their outline.

The Anal fin arises immediately back of the anus, which is very large, and terminates on a plane with the dorsal; in height, this fin is about one third that of the dorsal.

The Caudal fin in length less than one third its height.

The fin rays are as follows: D. 74; P. 20; A. 46; C. 16.

FAMILY XIII.

PECTORALES PEDICULATI.

LOPHIUS. Lin.

Generic characters. *Head very large, depressed; body slender, smooth, without scales; two dorsal fins separated; pectoral fins broad and thick, somewhat resembling feet; ventral fins small, placed considerably before the pectorals; teeth differing in size, numerous, conical, sharp, curving backwards; tongue broad; branchial cavities large, with only a small opening behind the pectoral fins; branchiostegous rays* 6.

L. *piscatorius*. Lin. *The Angler. Frog Fish. Sea Devil. Goose Fish. Wide Gab.*

Pennant's British Zoology, vol. iii. 105, et fig.
Shaw's Zool. vol. ii. 379, et fig.
Strack's Plates, x. 1.
Trans. Lit. et Philosoph. Soc. N. Y. vol. i. 464.
Mc Murtrie's Cuv. vol. ii. 184.
Yarrell's British Fishes, i. 269, et fig.

Specimens of this species are yearly taken in Massachusetts Bay by our cod fishers; with whom, it is generally known as the "*Goose fish*," although sometimes incorrectly called the "*Monk fish*."

A perfect specimen of this loathsome looking fish was brought me by my old friend, Capt. Nathaniel Blanchard, which he captured September 6th, 1837, in Boston Bay. It measured forty-four inches in length, and thirty-five in breadth, with the gape of the mouth nine inches in extent. As, at that time, I did not think of minutely describing each of our species, I was satisfied to compare it with several descriptions, with which I found a perfect correspondence. Since then, I have been unable to procure another specimen for description, and therefore copy Yarrell's account, which is concise and very clear.

"The number of fin rays is D. 111–12; P. 20; V. 5; A. 8; C. 8.

The head is wide, depressed; the mouth nearly as wide as the head; lower jaw the longer, bearded or fringed all round the edge; both jaws armed with numerous teeth of different length, conical, sharp, and curving inwards; teeth also on the palatine bones and tongue; three elongated, unconnected filaments on the upper part of the head; two near the upper lip, one at the nape, all three situated in a depression on the middle line; eyes large, irides brown, pupils black; pectoral fins broad and rounded at the edge, wide at the base; branchial pouches in part supported by the six branchiostegous rays. Body narrow compared with the breadth of the head, and tapering gradually to the tail; vent about the middle of the body; the whole fish covered with a loose skin.

Color of the whole upper surface of the body uniform brown; fin membranes darker; under surface of the body, ventral, and pectoral fins white; tail dark brown, almost black."

By the motion of the filaments with which the head of this species is furnished, it is supposed to allure within its reach smaller species upon which it voraciously feeds. That it however sometimes seizes large and powerful fishes, we learn from Pennant, who says it is so highly regarded by the fishermen on the coast of *Scarborough*, being supposed by them to be a great enemy of the *dog fish*, that it is set at liberty whenever taken: and he adds in a note, "the bodies of these fierce and voracious fish are often found in the stomach of the Fishing frog."

CHIRONECTES. CUV.

Generic characters. *Four rays on the head, as in Lophius; the first of which is slender, and frequently terminating in a tuft; the succeeding ones, augmented by a membrane, are sometimes much enlarged, and at others, united into a fin. The body and head are compressed; the mouth cleft vertically: the only opening of the branchiæ, which are furnished with four rays, is a canal, and a small hole behind the pectorals; the dorsal occupies nearly the whole length of the back. The entire body is frequently provided with cutaneous appendages; there are four branchiæ; the natatory bladder is large, and the intestine moderate, and without coeca. These fishes, by filling their enormous stomachs with air, are enabled to expand their belly like* *a balloon ; on land, three pairs of fins enable them to creep almost like small quadrupeds, the pectorals, from their position, performing the functions of hind feet, and thus they live out of water for two or three days.*

C. *laevigatus.* Cuv. *The smooth Chironectes.*

Trans. Lit. et Philosoph. Soc. fig. ix. pl. iv.

Several specimens of this fish were sent me from Holmes Hole, by Dr. Yale; all of them very small. From the largest individual, I have drawn up the following description:

Length one and a quarter inches. *Body* very much compressed upon the sides, tapering from the head, where it is highest, to the tail. Color a dull white, with irregularly distributed dark brown blotches, or partially formed longitudinal bands, which are margined with a clear white: clear white spots upon the abdomen. *Mouth* vertical, very large. *Eyes* moderate in size. *Jaws* with numerous very minute teeth. A dark-colored flexible ray in front of, and between the eyes, with a slight filament suspended from its extremity; back of this, a larger, stouter ray, with a membrane attached posteriorly; this ray also supports a filament. Very slight cutaneous appendages beneath the lower jaw.

The Dorsal nearly half an inch long, variegated by the continuation upon it of the black blotches upon the body.

The Pectorals stout, about one fourth of an inch long, color of the dorsal.

The Ventrals in front of the pectorals, colored like the other fins.

The Anal straight at the extremity.

The fin rays are as follows: D. 11; P. 8; V. 4; A. 6; C. 6.

BATRACHUS. Bloch.

Generic characters. *The head horizontally flattened, broader than the body; the mouth well cleft; operculum and suboperculum spinous; six branchial rays; the ventrals narrow, inserted under the throat, and formed of but three rays, the first of which is elongated and widened; pectorals supported by a small arm, the result of the elongation of the carpal bones. The first dorsal short, and supported by three spinous rays; the second is soft and long, as well as that of the anus, which corresponds to it. The lips are frequently furnished with filaments. Those which have been dissected, present a stomach resembling an oblong sac, and short intestines, but there is no coecum. The fore part of the natatory bladder is deeply bifurcated. They keep themselves hidden in the sand, to surprise their prey, like the Lophius, &c.; the wounds inflicted by the spines are reported dangerous.*

B. *variegatus.* Le Sueur. *The Toad Fish.*

Journal Academy Nat. Sciences, Phil. vol. iii. p. 398.

To Dr. Yale, I am indebted for two fine specimens of this species, from Holmes Hole. He informs me, they are generally found in ponds and lagoons connected with the sea in muddy water: in winter, they are captured through the ice in spearing *eels;* and are not used for food. Each of these specimens was eleven inches in length. Color yellowish; entire surface of the head, sides and abdomen marbled with black; the head so closely dotted as to appear almost black; sides irregularly undulated; abdomen less closely marked. All the fins banded with black lines. Whole of the body enveloped with a copious viscid secretion, which flows from numerous mucous pores every where distributed: beneath each eye, are eight very distinct glands: they are also observed upon the opercula. *Head* very much compressed; its length and breadth equal. *Body* much narrower than the head; gradually tapering from the base of the pectorals to a short distance back of the anus, beyond which it becomes very much compressed. *Operculum* armed with three distinct spines, the upper most prominent: cheeks protuberant. Diameter of the eye three lines; pupils black; irides golden: over the middle of each eye is situated a large fleshy appendage which hangs down over the eye, and, just before this, a very small appendage. *Mouth* very large; lips fleshy; on the chin four small fleshy appendages; directly beneath these, two smaller ones; on a line with these latter, three larger appendages on each side, with a still larger one at the angle of each jaw. Lower jaw longer than the upper; a single row of strong conical teeth in each jaw upon its sides; with more than one row in front of the jaw.

Teeth on the vomer. *Tongue* small. Branchia. aperture as wide as the base of the pectorals. The *lateral line*, which is studded with very distinct mucous pores throughout its whole extent, arises just back of the upper spine of the operculum, and runs in nearly a straight course high up on the back to the tail.

The first Dorsal fin is quite small, and arises just back of the head: it is composed of three spinous rays, of which the second is longest.

The second Dorsal commences directly behind the first, and terminates just in front of the tail; it is beautifully marked with seven broad, oblique black bands: this fin, at its posterior extremity, is one third less high than at its middle.

The Pectorals originate at the lower edge of the branchial opening. The fleshy portion of their base is sprinkled with irregular markings like the head: the rays of these fins are crossed transversely by six interrupted black bands, those at the base being the narrowest.

The Ventral fins originate some distance in front of the pectorals; they are composed of three rays; the centre is large, externally fleshy, falciform.

The Anal fin commences rather further back than the dorsal; it is marked with seven oblique black bands. The fleshy extremities of this fin, like those of the second dorsal, are free, and present a digitated appearance.

The Caudal fin has five uninterrupted transverse dark bands, the two at base, narrower than the others.

The fin rays are as follows: B 3; D. 3, 25; P. 16; V. 3; A. 24; C. 14.

The specimens from which Le Sueur described this species, as being found at Egg Harbor, N. J., were much smaller than those I have seen, being less than six inches: in some unimportant respects, his description differs from the appearance of my specimens, an account of which is here presented: the ichthyologist will at once perceive that they might very naturally be produced by difference of age and locality.

FAMILY XIV.

LABROIDES.

LABRUS. Lin.

Generic characters. *Body elongated, covered with large thin scales: a single dorsal fin, extending nearly the whole length of the back; part of the rays spinous, the others flexible; behind the point of each spinous ray a short membranous filament: lips large and fleshy; teeth conspicuous, conical, sharp; cheek and operculum covered with scales; preoperculum and operculum without serrations or spines.*

L. *Americanus.* Bloch. *The Tautog. Black Fish.*

Trans. Lit. et Philosoph. Soc. N. Y. p. 399, et fig.

Although a very few years only have passed since this species was brought into Massachusetts

Bay, it is now taken along a large portion of the coast. At Plymouth and Nahant, at some seasons, it is found in no inconsiderable numbers, and is frequently caught from the bridges leading from Boston. From one of these bridges, a specimen was taken a few years since, weighing eleven pounds and three quarters. The Boston market is for the most part supplied, however, by Wellfleet. I am informed that in 1836 three smacks were constantly employed in the harbor of South Wellfleet, in the *tautog fishery*, from April to November, and that it was a profitable occupation to those engaged in it. Large numbers are carried from this latter place to New York. At New Bedford, 300 pounds of *fresh tautog* have been sold by a single market-boat in a day. This fish is also pickled at the last place, and may be kept in a weak brine for a long time. In this state, they are considered by epicures a great delicacy. Mr. Henry Blood, of New Bedford, informs me, that a specimen of this fish was taken in Rochester harbor, which weighed fourteen pounds and three ounces. The largest individual of which I have any knowledge, weighed sixteen pounds.

This species varies considerably in its markings; generally, however, it is of a bluish black above, diversified with bands and blotches, mottled with darker spots towards the abdomen. *Abdomen* whitish.

Body regularly arched from the tip of the snout to the extremity of the dorsal fin. Length of the head to the posterior angle of the operculum, about one fourth the length of the body, including the tail. *Head* naked, save a patch of small scales upon the upper part of the operculum, and a vertical band of similar scales upon the preoperculum, just back of the eyes. Lips large and fleshy: *jaws* with a single row of strong conical teeth, those in front, largest; teeth in the pharynx. *Nostrils* double, small, above and in front of the anterior angle of eye. *Eyes* circular; pupils blue black; irides silvery, dusky after death; diameter of the eye equal to half the distance between eyes. The *lateral line* arises just above the operculum, and curves with the body.

The Dorsal fin arises on a line with the pectorals; the first seventeen rays terminate in naked spines, at the base of which are small floating, fleshy tentacula; the posterior fleshy rays of this fin are nearly as high again as the spinous rays; the fin extends to within a short distance of the tail. Base of the rays with scales.

The Pectorals commence just in front of the posterior angle of the operculum; of the color of the abdomen, rounded at the extremity. Length to height as 1 to 3.

The Ventrals are situated a short distance back of the pectorals; above, dark colored; beneath, white; length about one third their height. The outer ray spinous.

The Anal fin arises opposite the sixteenth spinous ray of the dorsal fin, and terminates on the same plane with that fin; the three first rays are spinous; fin longer than high.

The Caudal fin is even at its extremity; length of the fin one third greater than its height.

The fin rays are as follows: D. 28; P. 15; V. 6; A. 11; C. 15.

CRENILABRUS. CUV.

Generic characters. *The Crenilabri have all the external and internal characters of the true Labri, but are distinguished from them by the denticulation of the edge of the preoperculum. They are generally a little deeper also in the body compared with their length.*

C. *burgall.* Schoepp. *The Conner. Blue Perch. Chogset.*

Trans. Lit. et Philosoph. Soc. N. Y. p. 402.

From the middle of June until September, this is a very common species in our waters. It is taken along our whole *sea-board,* not only by the fishermen's nets in myriads, but by the needy and destitute from our wharves and bridges, and is an excellent fish for the table.

The colors of this species vary exceedingly; thus, in the same sweep of the net, some are taken of a deep bluish color; others, spotted over their entire surface with yellowish spots; and others, almost of an uniform rust color.

My description is drawn up from a specimen nine inches in length. *Body* above, rusty; sides, spotted over their whole surface with lighter colored spots than the ground of the back; *abdomen* of a bluish white color, with sparse spots. Lower part of the *gill-covers*, together with the throat, and ventral and anal fins, blue. Depth of the body across the base of the ventrals, exclusive of the dorsal fin, rather more than two inches. Length of the head two inches, slightly flattened on its top; a perceptible convexity back of the neck, in front of the dorsal fin. Preoperculum finely denticulated upon its posterior edge; a fleshy prolongation at the posterior angle of the operculum. Between, and in front of the eyes, irregular bluish lines, appearing like hieroglyphics, more strongly marked than on the neck. Diameter of the eye, one line less than the distance between the eyes; pupils black; irides silvery. *Jaws* equal, and with numerous teeth; those in front larger, recurved; teeth also on the pharynx. The *lateral line* distinct, of a darker rust color than the sides, curving very slightly with the body until just before the termination of the dorsal fin, when it suddenly curves downwards two lines, and then passes straight to the tail.

The Dorsal fin arises on a line with the posterior angle of the operculum, and terminates within about an inch of the tail. It has about eighteen strong rays, the spines of which project at their tips; the upper portion of their connecting membrane is free, giving the appearance of filaments; the eleven last rays are membranous. The spinous rays gradually increase in height to the membranous rays, which are still more elevated.

The Pectorals arise on a line with the dorsal; their height to their length is as 2 to 1.

The Ventrals are situated back of the pectorals; the first ray spinous.

The Anal fin has its first three rays spinous; its length to its height as 2 to 1.

The Caudal fin is nearly even at the tip; its rays one third longer than high.

The fin rays are as follows: B. 5; D. 18–11; P. 15; V. 6; A. 12; C. 16.

FAMILY XV.

FISTULARIDAE.

FISTULARIA. Lin.

Generic characters. *A single dorsal, most of which, as well as of the anal, is composed of simple rays. The intermaxillaries and the lower jaw are armed with small teeth. From the two lobes of the caudal proceeds a filament which is sometimes as long as the body. The tube of the snout is very long and depressed, the natatory bladder excessively small, and the scales invisible.*

F. *serrata.* Bloch. *The Tobacco-pipe Fish.*

Although Richardson, in his "*Fauna,*" observes that the "*Fistularia tabaccaria* frequents the coast of the United States," it must be exceedingly rare in the waters which border New England; as I have neither met with one myself, nor heard of one's being seen by any individual whose accuracy could be relied upon. Richardson also remarks, that the "F. *serrata* frequents the West Indies and the sea of Brazil." Cuvier, in the notes to his "*Regne Animal*," refers to Catesby's plates for a figure of this species; he could not infer, from this figure, that the species was the "*serrata*," unless he had also received a specimen of the fish, and concluded it was the only Fistularia found upon the coast of the United States. Catesby's figure is represented with two dorsal fins.

The specimen before me was sent several years since to this city by Dr. Yale, who procured it at Holmes Hole. It is still in a state of fine preservation, and belongs to the cabinet of the "Boston Society of Natural History." It has not the spots upon its sides which are possessed by the *tabaccaria;* nor does it agree with the figures of that species in Rees' Encyclopedia; Sonnini's Buffon; Strack's Plates; or Shaw's Zoology: but in the fifth volume of Shaw's Zoology, the author observes, "a variety has been described by Dr. Bloch, in which this part" (referring to the tail) "was double, and the snout serrated." A figure of the tail of this variety, as he calls it, is also represented by Shaw. This is undoubtedly our fish; and, although I have no means of ascertaining what the "*serrata*" is, having neither Bloch nor any other work on ichthyology, which speaks of it, yet, looking at its serrated intermaxillaries, and lateral line, I have no doubt that the species before me is that fish. Dr. Yale writes me it is not often found.

My specimen is ten inches in length. Upper part of the body, of a reddish brown color; a narrow bluish band upon the sides, through the centre of which, runs the *lateral line* which commences just above the posterior portion of the operculum, and runs obliquely backwards about an inch, then approximating that of the opposite side, runs a straight course an inch and a half; then passes down upon the side. At first, this line is quite indistinct, but more prominent towards the posterior half of the body; it becomes a sensible ridge, which, back of the dorsal, is quite strongly serrated. *Abdomen* lighter colored than the back; throat white. Entire length of the head, from the tip of the snout to the posterior extremity of the intermaxillaries, nine inches. *Tube* of a hard, horny consistence, strongly serrated laterally upon its upper portion, and less distinctly above and beneath; wider than deep; width just in front of the eyes, three quarters of an inch; at the angle of the jaws, half an inch. Vertical gape of the mouth, half an inch: *jaws* armed with numerous small teeth; lower jaw longer than the upper, with a protuberance at the chin. *Gill-covers* perfectly smooth, with a serrated portion above them, three quarters of an inch in extent.

The Dorsal fin is triangular, same color as the abdomen; situated upon the posterior third of the body.

The Pectorals are situated a quarter of an inch back of the operculum; their length to their height is about as 1 to 3.

The Ventrals are two and a half inches back of the pectorals, very small; half of an inch long; color of the abdomen.

The Anal, similar in form to the dorsal, is directly opposite that fin.

The Caudal is deeply forked, being nearly an inch wide between the lobes at the extremities, when they are expanded. Directly from the centre of this fin, as if it were a continuation of the lateral line, proceeds a strong filament nine inches in length, jointed at its commencement like some of the *Gorgoniae*, which becomes exceedingly delicate at its termination. From its base, another very minute filament arises.

The fin rays are as follows: D. 14; P. 16; V. 6; A. 14; C. 16.

ORDER II.

MALACOPTERYGII ABDOMINALES.

FAMILY I.
CYPRINIDÆ.

CYPRINUS. Lin.

Generic characters. *Body covered with large scales; a single elongated dorsal fin; lips fleshy; mouth small; teeth in the pharynx, but none on the jaws; branchiostegous rays* 3.

C. *auratus.* Lin. *The golden Carp.*

Pennant's British Zoology, vol. iii. p. 327.
Yarrell's British Fishes, vol. i. 315 et fig.

This species is so well known that, did not this report contemplate a description of every fish known to inhabit our waters, I should pass it by, after having merely included it in my catalogue. It is found in quite a number of ponds in the vicinity of Boston, connected with the country seats, bearing perfectly well the rigors of our winters, and breeding in great numbers. I have seen them at Brookline, Cambridge and Brighton; from the latter place, the specimens before me were received, through the politeness of my friend Samuel Downer, Jr.

The following appearances are presented: Form oblong; body slightly arched from the occiput to the commencement of the dorsal fin, and then gradually curved to the termination of that fin. Color, a bright orange on the upper part of the body; lighter upon the sides; white beneath. Scales large, exhibiting several striæ, and, under the microscope, a great number of very minute points or granulations, giving a rough feel to their surface. The number of the scales in an oblique direction, from the origin of the dorsal fin to the abdomen, is ten. The *lateral line*, which is very distinct and nearly straight, passes through the seventh row of scales. Length of the head, one fifth the length of the body, flattened between the eyes: *eyes* moderate in size; pupils black; irides silvery; diameter of the eye equal to half the distance between the eyes. *Mouth* small; *jaws* toothless; upper jaw the longer. *Nostrils* large. Suborbitar and opercular surfaces, golden; the latter covered with delicate striæ.

The Dorsal fin arises on the anterior half of the body, as long again as high: the first two rays are spinous; the first, very short and slightly roughened behind; the second, large and strongly serrated behind.

The Pectorals arise in front of the dorsal fin, at a distance equal to half their length; their length equal to one sixth their height.

The Ventrals are situated under the anterior portion of the dorsal fin, at the posterior third of the pectorals; their length to their height as 2 to 7.

The Anal fin is higher than long; its first two rays are spinous, serrated behind, resembling those of the dorsal.

The Caudal fin is lunated, its depth at the base to its length as 6 to 9.

The fin rays are as follows: D. 15; P. 15; V. 9; A. 17; C. 18.

The appearances of this species in color, forms of its fins, and many other particulars, vary exceedingly by domestication.

CATOSTOMUS. Le Sueur.

Generic characters. *Back with a single fin; gill membranes three rayed; head and opercula smooth; jaws toothless and retractile; mouth beneath the snout; lips plaited, lobed, or carunculated, suitable for sucking. Throat with pectinated teeth.*

C. *Bostoniensis.* Le Sueur. *The common Sucker.*

Memoirs of American Academy of Arts and Sciences, vol. xxi., et fig.
Journal Academy Nat. Sciences, Phil. vol. i. et fig.

This species was first described by Peck, in the "*Memoirs of the American Academy of Arts and Sciences,*" and quite well figured as the "*Cyprinus catostomus*" of Foster. In the excellent monograph of the genus "*Catostomus*" contained in the first volume of the "*Journal of the Academy of Natural Sciences,*" Le Sueur describes and figures this fish with the specific name of "Bostoniensis." In the spring and autumn, it is not unfrequently found in the Boston market; and in a mild winter, it may be met with at almost any time. They are generally taken in Charles River at Watertown, and sometimes attain the weight of five pounds. But little value is attached to them by the fishermen, and not unfrequently they are thrown away for want of demand. They are occasionally brought into the city by the cartload, and palmed off upon the ignorant, as the *mullet.*

The specimen before me is fifteen inches in length. Body subcylindrical. Color of the back a slight brown, darker towards the head, which is nearly olive colored; sides of a reddish brown, presenting a beautiful metallic lustre; beneath, white. Scales on the anterior portion of the body much smaller than upon the posterior. Length of the head to the entire length of the body, including the tail, as 1 to 5; head perfectly smooth; rows of mucous pores are seen on the back of the head, and above and beneath the eyes. *Eyes* moderate in size, circular; pupils black; irides golden; distance between the eyes equal to one quarter the length of the head, when the jaws are closed. *Mouth* small; lips corrugated; jaws destitute of teeth. *Opercula* golden. *Nostrils* just in front of the eyes; double; anterior, larger and circular; posterior, narrower and transverse. The *lateral line*, which is composed of sixty-four scales, commences back of the anterior portion of the operculum, and curving slightly downwards, assumes nearly a straight course, which is continued to the base of the caudal rays.

The pectoral, ventral and anal fins are reddish. The dorsal and caudal are of a dark brown.

The Dorsal fin arises back of the middle of the body, and is rather longer than high.

The Pectorals commence just behind the branchial opening; their height to their length as 2 to 1.

The Ventrals arise on a line opposite the middle of the dorsal fin, and are in length to their height as 1 to 3.

The Anal fin, which is rather rounded than pointed, is in length to its height as 1 to 2. The anus is at the origin of the anal fin.

The Caudal fin is deeply forked; and its depth at the extremity is to its depth at its base as 2 to 1.

The fin rays are as follows: D. 13; P. 18; V. 10; A. 9; C. 18.

C. *tuberculatus*. Le Sueur. *The horned Sucker.*

Journal Academy Nat. Sciences, Phil. vol. i. p. 93.

Of this species, described by Le Sueur from specimens obtained in Pennsylvania, I have seen but two individuals, which were taken at Watertown with the preceding species. I am informed it is not an uncommon fish in the ponds of various parts of this State and New Hampshire, and that it is called, very incorrectly however, the "*Barbel.*"

A specimen, fourteen inches in length, presents the following appearances. Greatest depth rather less than one and a half inches; width across the body, from the commencement of the dorsal fin, about three inches. This species is readily distinguished from the C. "*Bostoniensis*," our most common sucker, *by its being less elongated, and deeper;* and *by the gibbosity of the nape of the neck;* and *from all other species, by the tubercles on its snout.* Color above, dark brown; sides yellowish; beneath white. Scales large, with golden reflections, and distinct radii. Length of the head, two inches four lines; above livid; sides, of a dull white. Between the eyes and the snout, four prominent horns on each side; the upper anterior the largest, being two lines in height; the upper posterior the smallest. Beneath the first tubercle, a smaller is seen, and directly behind it, a third, nearly as large as the first: these three first form a triangle. Just above the third tubercle, and in front of the upper anterior angle of the eye, and between the nostrils and the eye, is a fourth tubercle smaller than the others. *Eyes* very small; pupil black, surrounded by a red ring. *Nostrils* double. *Mouth* small, lunated. *Back* rises suddenly on the nape of the neck, leaving a sensible depression before it.

The Dorsal fin arises upon the anterior half of the body; its height one third less than its length.

The Pectorals are reddish, with brown tips; length equal to one third their height.

The Ventrals of the same color, and same length as the pectorals.

The longest rays of the Anal fin more than one third higher than the length of the fin.

The lower lobe of the Caudal fin slightly longer than the upper.

The fin rays are as follows: D. 15; P. 16; V. 9; A. 10; C. 22.

I have no doubt that this is the "*tuberculatus*" of Le Sueur. He describes his specimen as having but *three* tubercles. This was owing undoubtedly to the smallest tubercle having fallen off, which I find is the case with one on one side of the specimen before me, without leaving the slightest mark to point its location.

C. *nigricans*. Le Sueur. *The black Sucker.*

Journal Academy Nat. Sciences, vol. i. p. 102.

By the kindness of Mr. H. Erastus Clap, of Walpole, I received, in May, 1838, eight beautiful fresh specimens of this species, which enabled me to test its goodness at my own table, besides supplying several of my friends, who agreed with me, that, although its flesh was rather dry, it was much preferable to that of the "*Bostoniensis*." The largest of these specimens was twenty inches in length, and weighed three and a half pounds. From a specimen fifteen inches in length, the following description is made, as being more nearly like the specimen from which Le Sueur drew up his description, than the larger specimens.

Color of the back, black; sides reddish yellow, with black blotches; beneath, white, with golden reflections. Scales moderate in size. *Head* quadrangular, one fifth the length of the fish; top of the head of a deeper black than the body. *Eyes* moderate, oblong; pupils black; irides golden. *Mouth* large; corrugations of the lips very large, particularly those of the lower lip. The *lateral line* arising back of the operculum, on a line opposite the centre of the eye, makes a very slight curve downwards, and then pursues nearly a straight course to the tail; it is composed of sixty scales. *Back*, between the head and dorsal fin, rounded.

The Pectoral, Ventral and Anal fins are reddish.

The Caudal and Dorsal, blackish.

The Dorsal fin in height is equal to two thirds its length.

The third and fourth rays of the Anal fin, which are longest, extend a little on to the rays of the caudal fin.

The fin rays are as follows: D. 13; P. 18; V. 9; A. 8; C. 18.

In two of the eight specimens, there were but twelve rays in the dorsal fin.

In larger specimens than that just described, the back is not black, but, together with the sides, is of an olive brown color; in others again, the back is neither black nor olive brown, but reddish, like the sides; in some specimens, a longitudinal band of a deeper red than the rest of the side, runs the whole length of the fish, just beneath the dark-colored back. The golden tints reflected from the opercula, and the scales along the entire sides of this species, give it a very brilliant appearance. It is known by the common name of "*Black Sucker.*"

C. *gibbosus*. Le Sueur. *The gibbous Sucker.*

Journal Academy Nat. Sciences, vol. i. p. 92, et fig.

I have never met with this species, which Le Sueur "discovered in the river Connecticut, near Northampton, where it is called *Chub Sucker*," and therefore extract his description, from the "*Journal of the Academy of Natural Sciences of Philadelphia.*"

"Back elevated in front of the dorsal fin, which is almost as high as broad, and rounded; anal fin bilobated. *Head* nearly as high as long; snout short, roundish; tail straight; caudal fin semi-lunated, lobes roundish, the inferior one longer than the upper; *scales* very much crowded transversely a short distance from the opercula, but more developed on the rest of the body; the color of the back is a deep blue, with golden reflections; *pectoral*, *ventral* and *anal fins* of a fine reddish orange color; *caudal fin* tinted with carmine and violet; *dorsal fin* bluish green; abdominal scales red at their base; *lateral line* hardly perceptible; body marked with four or five faint transverse bands. Length of specimen eleven inches.

P. 16; D. 17; V. 9; A. 9; C. 18 rays.

Dr. Mitchell's description of the '*Cyprinus oblongus*' approaches to this; but there are important characters in my species, not noticed in that of the former, which preclude a conclusion that they are the same; therefore, as the matter now stands, I must consider the above a nondescript."

LEUCISCUS. Klein.

Generic characters. *The anal fin short, as well as the dorsal, but without strong rays at the commencement of either; no barbules at the mouth.*

L. *crysoleucas.* Mitchell. *The New York Shiner.*

Trans. Lit. et Philosoph. Soc. N. Y. vol. i. p. 459.
Fauna Boreali-Americana, p. 122.

This quite common species in the ponds throughout the State, is taken with the "*Pomotis vulgaris,*" "*Perca flavescens,*" "*Esox reticulatus,*" and "*Pimelodus nebulosus.*" It has been described by Mitchell, who does not, however, mention its general size, nor the proportion of its several parts compared to each other. The following description is drawn up from a *living specimen* of average size: Length of the fish, from the tip of the snout to the extremity of the tail, six and a half inches; width across the body, on a line with the base of the ventrals, two inches; length of the head to the posterior angle of the operculum, one inch and three lines. General color, a beautiful golden; top of the head and back, black; gill-covers a brighter yellow than the sides; preoperculum less brilliant than the operculum. *Head* above somewhat depressed; eyes, two and a half lines in diameter; pupils black; irides yellow; jaws without teeth. The *lateral line,* consisting of about fifty-six scales, commences just back of the superior angle of the operculum, half an inch above the base of the pectoral fin, and passing obliquely down over about eighteen scales, opposite the posterior extremity of the pectoral fins, very gradually passes up again towards the posterior extremity of the body, assuming a straight course, which is pursued to the base of the tail.

The Dorsal fin is of a light brown color; it commences about three lines back of the ventral fins, is five lines wide at the base, and partially shuts into a groove.

The Pectoral fins commence on a line with the posterior angle of the operculum; they are an inch long; yellowish, except the upper rays, which are nearly black.

The Ventrals are reddish.

The Anal fin, which is slightly tinged with reddish, commences on a line opposite the termination of the base of the dorsal, and, like that fin, is received into a groove.

The Caudal quite deeply forked; of the same color as the dorsal.

The fin rays are as follows: D. 9; P. 17; V. 9; A. 13; C. 19.

This fish is taken at all seasons, even through the ice in winter. It is seldom found in Boston market, but is generally taken for pickerel bait, and is considered the best bait for that fish.

L. *argenteus*. Nobis. *The silvery Leuciscus.*

By the name of "*Dace*," this species, which I suppose to be undescribed, is generally known in those portions of the State where it is found. The specimen before me I received from Worcester county. The following are its characters:

Entire length of the specimen, six inches two lines; depth of the head, half an inch; depth of the body across from the origin of the dorsal fin, one inch one line. Body elongated, but very slightly arched over the neck, and at the dorsal fin. Whole surface of the body, silvery; rather darker upon the back; head above, bluish; operculum cupreous; preoperculum rather inclined to a flesh color; exterior to the operculum, a narrow dark band encircles the head, from the base of the pectorals, separating the head from the body. *Scales* on the body moderate in size,—*nine*, in an oblique line, from the origin of the dorsal to the lateral line; and *four* in an oblique line beneath. Entire head destitute of scales; head above, flattened; diameter of the eye, one quarter of an inch; distance between the eyes, half an inch. *Nostrils* double; the anterior, circular; the posterior, oblique and larger. *Jaws* toothless; upper jaw the longer. The *lateral line* commences on the side of the snout, and passing back under the eyes, and up over the posterior angle of the gill-covers, curves downwards for the extent of eight scales, to opposite the middle of the pectorals, and then pursues a straight course to the caudal rays.

The Dorsal fin commences upon the anterior half of the body, including the tail; rays higher than long, color of the back; the first ray half as high as the second.

The Pectorals commence beneath, and on a line with the posterior angle of the operculum, elongated, lighter colored than the dorsal; length to height as 1 to 4; same height as the dorsal fin.

The Ventrals are directly beneath the dorsal fin, three quarters the height of the pectorals; color of the abdomen.

The Anal fin is one quarter of an inch back of the ventrals; its length to its height as 2 to 3; color of the ventrals.

The Caudal fin is deeply forked; as high again as long.

The fin rays are as follows: D. 9; P. 16; V. 8; A. 9; C. 20.

This species agrees in many particulars with the "L. *dobula*," but its *naked head*, and the *origin of its lateral line* prevent it from being considered that species.

L. *pulchellus*. Nobis. *The beautiful Leuciscus.*

This fine species answers in some particulars to the description and figure of the "L. *rutilus*," and this is undoubtedly the reason why it is often called the "*Roach*." In some portions of the State it receives the name of "*Cousin Trout.*"

For the beautiful specimen which enables me to draw up the following description, I am indebted to Mr. H. Erastus Clap, of Walpole.

Entire length, fourteen inches; depth across, in front of the ventrals, three inches; depth of the fleshy portion of the tail, one inch and a quarter. Length of the head, three inches. Back slightly arched, of a dark brown color; sides and abdomen of a beautiful flesh color, tinged with golden reflections. Head bluish on the top; gill-covers silvery, with cupreous and flesh-colored tints, and edged with a brown membranous prolongation. *Head* naked; arch on the top of the head very slight; diameter of the eye rather more than one twelfth the length of the head; distance between the eyes equal to one third the length of the head. *Nostrils* situated higher than the eyes, and in front of them; the posterior, the larger; the anterior, tubular. *Jaws* without teeth; upper jaw juts slightly over the under. Scales upon the body large, transparent, rounded at the summit, truncated at their base, exhibiting numerous striæ; at the base of each scale, a fleshy, dark-colored membrane exists, which, projecting as far as the apex of the preceding scale, gives the appearance of indistinct oblique bands across the fish; scales smaller upon the back, and smallest upon the throat. The *lateral line* commences at the superior angle of the operculum, and curving downwards nine scales, pursues nearly a straight course to the tail. The lateral line is composed of fifty-one scales; nine scales are situated above the lateral line in an oblique line from the origin of the dorsal fin, and six below the lateral line.

The Dorsal fin arises on the anterior half of the body; is nearly as high again as long; the first ray is one fourth the height of the second; the general color of the fin like the back; the firmest portion of the rays, reddish.

The Pectorals arise beneath, and one line anterior to the posterior angle of the operculum; above, brownish; beneath, lighter, rounded at their extremities; length to height as 1 to 4.

The Ventrals are situated beneath the dorsal; above, color of the abdomen; shorter than the pectorals.

The Anal arises opposite a line about three quarters of an inch back of the dorsal fin, and is higher than long. The first ray bears the same proportion to the length of the second, as the first ray of the dorsal to the second ray of that fin.

The Caudal fin is large; height of the rays in the middle of the fin, one inch; width at the extremities, when expanded, three inches.

The number of the fin rays is as follows: D. 10; P. 17; V. 8; A. 10; C. 22.

L. *atronasus*. Mitchell. *The brook Minnow.*

Trans. Lit. et Philosoph. Soc. p. 460.

This beautiful little species is seen in our brooks in large numbers. From a specimen an inch and six lines in length, I draw up the following description: Greatest depth, four lines. Upper part of the body greenish; a broad black band passes from the snout across the eye longitudinally through the middle of the fish to the caudal rays; body beneath this band white, with cupreous reflections. Upon the upper edge of this band, runs the *lateral line.* Above this, a golden parallel band narrower than the darker colored; from the anterior portion of the head, along the dorsal ridge, a narrow band, similar to that last spoken of. When the fish is swimming, the three bands give it a very pleasing appearance. Length of the head about one fifth the length of the fish; the top of the head darker colored than the rest of the fish, flattened. *Jaws* destitute of teeth; the upper jaw the longer, semi-circular; lip corrugated; the lower jaw elevated to a point in its middle, forming a triangle. *Eyes* moderate in size; pupils black; irides golden. *Gill-covers* silvery, with golden reflections. Scales on the body small; nine scales in an oblique line from the origin of the dorsal to the lateral line.

The Dorsal fin arises just in front of the ventrals; brownish; transparent; higher than long.

The Pectoral fins yellowish; arising on a line with the posterior angle of the gill-covers.

The Ventrals, of the color of the abdomen, are situated under the middle of the dorsal fin.

The Anal is situated just in front of the caudal fin; its length equal to one third its height.

The Caudal fin is forked.

The fin rays are as follows: D. 13; P. 10; V. 9; A. 7; C. 18.

HYDRARGIRA. Le Sueur.

Generic characters. *Ventral fins* 6 *rayed; teeth in the jaws and throat; those of the jaws conic and* *recurved; none in the palate; jaws protractile; lower jaw longer than the upper one: dorsal fin one, situate nearer the tail than the head, opposite to the anal fin: scales on the opercula and body: head flat, shielded above with large scales, the centre scale largest.*

H. *nigro-fasciata.* Le Sueur. *The banded Minnow.*

Journal Academy Nat. Sciences, vol. i. p. 133.

Several specimens of a beautiful little species answering in the important characters to Le Sueur's "*nigro fasciata,*" were sent me by Dr. Yale. From the largest of these, I draw up the following description:

Length of the fish two inches. Color above, a yellowish green; beneath, silvery white, crossed transversely by from ten to fourteen black bars commencing upon each side of the dorsal ridge, and passing down towards the abdomen; the bands cross entirely the fleshy portion of the tail; in front of the ventrals, they reach only the lateral edges of the abdomen. Length of the head half an inch. *Head* flattened above. *Eyes* less than a line in diameter, which is less than the distance between the eyes. *Gill-covers* silvery, with a bluish blotch upon the operculum. *Jaws* very projectile; the lower slightly in advance of the upper.

The Dorsal fin is just back of the middle of the body; transparent; greenish white; height equal to its length.

The Pectorals are lighter colored than the dorsal; length to height as 1 to 4.

The Ventrals are quite small, the color of the abdomen; commencing on a line with the extremities of the pectorals.

The Anal fin the color of the ventrals; length to height as 1 to 3.

The Caudal fin is yellowish; length to height as 1 to 3.

The fin rays are: D. 12; P. 18; V. 6; A. 12; C. 17.

H. *ornata.* Le Sueur. *The ornamented Minnow.*

Journal Academy Nat. Sciences, vol. i. p. 131.

This species of *Hydrargira*, very common about the salt marshes in the vicinity of Boston, I suppose to be a variety of the "*ornata*" of Le Sueur. It may be taken in large numbers with small hand nets. I am not aware that it is often made use of; but I have seen a flock of the domestic duck swallowing it with the greatest avidity, when thrown to them in quantities, in the same manner as grain.

The specimen before me is three inches in length. Back dark brown; sides lighter; beneath white. Back depressed; sides, in some specimens, of a beautiful metallic tint, giving the appearance of an indistinctly defined yellow band. Length of the head, three quarters of an inch; flattened above; gape of the mouth moderate; teeth in the jaws small and sharp; the lower jaw curves upwards. *Eyes* of moderate size; irides yellowish; the circle immediately surrounding the pupil, a bright yellow. Preoperculum of a silvery white color; operculum, a bright metallic yellow.

The Dorsal, pectoral and caudal fins, color of the back; ventral and anal fins, lighter.

The Dorsal fin commences half way between the head and the tail; rather longer than high.

The length of the Pectorals is two lines; height, six lines.

The Ventrals are very small.

The Anal fin is situated under the middle of the dorsal fin.

The Caudal fin rounded.

The fin rays as follows: D. 12; P. 15; V. 6; A. 10; C. 18.

In the smaller specimens, a bright yellow spot is seen at the origin of the dorsal fin, while they are swimming; after death, this mark is not observed.

H. *flavula*. Mitchell. *The Basse Fry.*

Trans. Lit. et Philosoph. Soc. N. Y. p. 439.
Boston Journal of Natural History, vol. i. p. 418.

Meeting two years since with a fish belonging to the genus "*Hydrargira*," not described by Le Sueur in his paper upon that genus, I published a description of it, under the name of "*trifasciata*," in the first volume of this Journal. I have before me at the present moment, (June 13th, 1838,) a second specimen of this species, sent me by Dr. Yale; and I am satisfied it is the same fish that Mitchell described as the "*Esox flavulus*," in his "*Fishes* *of New York*," and that Cuvier, in his notes to the Regne Animal, considers as the "*Cyprinodon flavulus*," Valenc. As the branchiostegous membrane has but five rays, it cannot be a "*Cyprinodon*," Lacep. the species of that genus having six rays. It is, however, evidently Mitchell's fish, incorrectly called by him an "*Esox*." Although placed by him in a family to which it did not belong, still, as Le Sueur's genus was formed three years after Mitchell's description was drawn up, and as Mitchell accurately described it, his specific name has the priority; most cheerfully, therefore, is the specific name applied by me, relinquished. Mitchell calls it the "*New York Gudgeon*:" by our fishermen, however, it is known by the name of "*Basse Fry*," from its resemblance in the bands to the "*Striped Basse*." I have adopted this common name.

The following is my description, extracted from the first volume, page 418: Four longitudinal bands on each side of the body, and three transverse bands between the termination of the longitudinal bands and the base of the tail. The upper part of the body is of a yellowish green; on each side are four dark colored bands, running almost the entire length of the fish; the first of these is high on the back; the second passes from the upper edge of the operculum, in a direct line to its termination; the remaining two, commencing back of the pectoral fin, run obliquely upwards and backwards, to a point on a line with the centre of the ventral fin, then turn gently down, and are continued parallel with the two other bands.

At the base of the tail are three transverse bands of a similar color. All the under portion of the body is of a brilliant yellow. Snout elongated. Lower jaw straight. Length of the specimen 5 inches 5 lines; thickness seven and a half lines; depth one inch and one and a half lines.

The fin rays are: D. 14; P. 18; V. 6; A. 12; C. 18.

This fish was taken with other species of this genus in the marshes of this vicinity.

The specimen now before me varies in some slight particulars. Its length is four and a half inches. Quite a number of black spots upon the back. Two longitudinal bands on the sides; the upper, unbroken throughout its entire extent; the inferior broken at the posterior half of the body; the anterior being higher than the posterior portion of the band. Four transverse lines between the extremity of the longitudinal bands, and the caudal rays; that next to the tail, longer than either of the others.

The fin rays are: D. 15; P. 17; V. 6; A. 11; C. 20.

Family II.

ESOCES.

Esox. Lin.

Generic characters. *Head depressed, large, oblong, blunt; jaws, palatine bones, and vomer, furnished with teeth of various sizes; body elongated, rounded on the back; sides compressed, covered with*

scales; dorsal fin placed very far back, over the anal fin.

E. *reticulatus*. Le Sueur. *The common Pickerel.*
Journal Academy Nat. Sciences, vol. i. p. 414.

This fish, one of our most beautiful species, is known throughout the state as the "*pickerel.*" It is taken in most of the ponds and rivers, and is every where valued. Brought to Boston market in the spring and autumn, and frequently through the greater part of the winter, it meets with a ready sale. The largest specimens are received from Brewster, Cape Cod; individuals have been sold in Quincy market from that place, weighing seven pounds; and they are said to be taken there considerably larger even than this. Its color varies exceedingly in different localities; thus, while in some ponds it is of a greenish brown color, in others, the entire surface is of a brilliant golden; all however are more or less distinctly marked with the irregularly distributed longitudinal lines. The fishermen have an idea that the oil of this species, carefully prepared, is a good application for ear-ache, and it is collected by some for that purpose.

The specimen before me is sixteen inches in length; head about one fourth the length of the body; width of the head, in front of the eyes, equal to half of its length. Body above green; sides of a beautiful golden yellow, marked over their whole extent with dark lateral lines about one third of an inch in width, which, by their irregular union, produce imperfect reticulations; beneath white. **Snout** obtuse; gape of the mouth great. **Lower jaw** longer than the upper; teeth in front of the lower jaw small; on sides large and pointed. ***Eyes*** moderate in size; pupils black, irides yellow. ***Nostrils*** double. Fins greenish. The pectoral, anal and ventral fins become reddish after death; this is more marked in the larger specimens.

The Dorsal fin from one to two lines longer than the anal.

The Pectorals commence on a line with the sixteenth branchial ray, (counting from the anterior portion of the head backwards.)

The Ventrals are situated two and a half inches in front of the dorsal fin.

The Anus is large; two lines in front of the anal fin.

The commencement of the Caudal fin is about two inches back of the dorsal fin.

The fin rays are: B. 17; D. 18; P. 13; V. 11; A. 17; C. 19.

BELONE. CUV.

Generic characters. *Head and body greatly elongated; the latter covered with minute scales; both jaws very much produced, straight, narrow, and pointed; armed with numerous small teeth; the dorsal fin placed over the anal fin.*

B. *truncata.* Le Sueur. *The Gar Fish.*

Journal Academy Nat. Sciences, vol. ii. p. 126.

To Dr. Yale I am indebted for a fine specimen of this species, taken at Holmes Hole, which enables me to offer the accompanying description. Length fifteen inches; greatest depth one inch. Above, of a light green color; beneath, a clear silvery white. Just above the base of the pectorals, a deep blue band arises and passes in a straight line to the origin of the dorsal fin. Length of the head, from the angle of the jaws to the posterior portion of the operculum, one inch six lines; flattened above, compressed on the sides. Length of the lower mandible, from the tip to the eyes, three inches five lines, and fleshy at its tip; three lines longer than the upper mandible; both mandibles armed with distant, very sharp, conical teeth, between which are numerous others, very minute; no teeth upon the upper mandible, for the extent of two lines from its extremity. *Eyes* circular, three lines in diameter; pupils black, irides silvery. Distance between the eyes about equal to the diameter of the eyes. *Gill-covers* silvery; at the posterior edge of the preoperculum, a vertical blue band, about four lines long. Immediately in front of the eyes, a triangular space, in which are situated the nostrils.

The *lateral line* arises at the inferior angle of the operculum, and passing gradually up to the posterior extremities of the pectorals, assumes a straight line, which is continued to the base of the caudal rays.

The Dorsal fin is situated upon the posterior fourth of the body; transparent, greenish, falciform, high anteriorly, very low posteriorly.

The whitish Pectorals are directly back of, and upon a line with, the posterior angle of the operculum; their length to the height of their longest rays, is as 2 to 8.

The Ventrals, of the color of the abdomen, are placed back of the middle of the body; their length to their height is as 1 to 4.

The Anal fin commences in front of the dorsal, and terminates upon the same plane as that fin; its longest rays are longer than those of the dorsal.

The Caudal fin is slightly truncated obliquely, the lower portion being the longer.

The fin rays are: D. 15; P. 12; V. 6; A. 19; C. 20.

I have no doubt of this being Le Sueur's "*truncata*:" he describes his specimen as being a "*deep blue on the back*;" it might have been a more recent specimen than mine; or the color of the fish before me may have been impaired by the salt in which it was sent me. In all important characters it answers perfectly to the species under which I arrange it.

SCOMBERESOX. Lacepedė.

Generic characters. *The species of this genus have the same structure of the jaws as those of Belone; and are similar also in the form of body and scales, with a keel-like edge to the belly; but the posterior portions of the dorsal and anal fins are divided, forming finlets, as in the mackerel.*

S. *equirostrum.* Le Sueur. *The Bill Fish.*

Journal Academy Nat. Sciences, vol. ii. p. 132.

Le Sueur described this species from a dried specimen in the cabinet of the Linnean Society, which formerly existed in Boston; his description shows his specimen to have been an imperfect one. I have seen no specimen in which the jaws were of equal length; the lower jaw was undoubtedly broken in the specimen seen by Le Sueur, as is very apt to be the case in dried specimens of this genus, else he could not have called it "*equirostrum;*" still as some naturalists think a specific name need not point out any particular character, and as I have no desire to detract from the labors of another, I shall point out here the characters as they exist in the recent specimen, and leave Le Sueur's name to be changed, should it ever be thought advisable, by some succeeding ichthyologist.

This fish makes its appearance at Cape Cod, usually, in the month of October, sometimes earlier and sometimes later, however, depending upon the season. It is taken in immense numbers by the inhabitants of some of the towns upon the Cape, and considered by them very nutritious and grateful food.

From a fine specimen sent me by Dr. Yale, which was taken upon Nantucket Shoals, I have drawn up the following account: Entire length, ten inches; from the extremity of the lower jaw to the anterior angle of the eye, one and three quarter inches. ***Body*** quite thick, nearly of equal width and depth from the pectorals to the origin of the dorsal fin. Back, for the depth of a quarter of an inch, of an olive green color; directly beneath this, a silvery band half an inch wide, almost as strongly marked as in the "*Atherines*," runs the whole length of the body, divided in its centre by a narrow longitudinal line of the same color as the back. *Abdomen* silvery, with a cupreous tinge. *Head*, including the jaws, three inches long, quite narrow, compared with the body, of a deep green color above; *gill-covers* large, smooth, silvery; *jaws* at their origin armed with very minute teeth; the lower jaw one quarter of an inch longer than the upper; eye one quarter of an inch in diameter; distance between the eyes, rather greater than the diameter of the eye.

The Dorsal fin, of a greenish color, is situated upon the posterior half of the body, longer than high; back of it, five finlets, of the same color as the dorsal fin.

The Pectorals are situated at the posterior angle of the operculum, dark colored at their fleshy origin; the rays silvery; the first ray longer and much broader than the others.

The Ventrals are situated one inch and a quarter in front of the anal fin; color of the abdomen; triangular, half an inch high.

The Anal fin commences directly opposite the dorsal, and terminates upon the same plane as that fin; between it and the tail, five yellow finlets.

The Caudal is equilobed, with transverse black lines upon the rays, resembling the joints of a reed.

On each side of the abdomen, commencing at the lower edge of the gill-covers, a longitudinal furrow, which passes along the whole length of the body, having between them a space of a quarter of an inch, the space wider at the ventrals.

The fin rays are as follows: D. 10; P. 14; V. 6; A. 12; C. 20.

Another specimen, taken with the preceding, lies before me, agreeing in all important particulars,—*form, color, proportionate length of jaws, and number of fin rays;* but having, like the "*scutellatum,*" (which Le Sueur described from a specimen "found in the stomach of a fresh codfish, which had been brought to Boston from the Bank of Newfoundland,") six dorsal finlets and seven anal; showing that the number of finlets cannot be relied upon for a specific character.

FAMILY III.

SILURIDÆ.

PIMELODUS. Lacepede.

Generic characters. *Body covered with a naked skin; no lateral armature; jaws and often palatine bones furnished with teeth, but there is no band of teeth on the vomer parallel to that on the upper jaw. The form of the head varies exceedingly, as well as the number of its barbules.*

P. *nebulosus.* Le Sueur. *The Horned Pout.*

Mémoires du Museum d'Histoire Naturelle, t. v. p. 149.

This species, very common in our ponds and streams, in company with the "*Perca flavescens,*" "*Pomotis vulgaris*," "*Labrax mucronatus*," "*Leuciscus crysoleucas*," &c. is known in the interior of the State by the vulgar names of "*Horn pout*," and "*Minister*." By many, it is highly esteemed as an article of food, and preferred to every species of our common fluviatile fishes, save the *pickerel*. It is generally fried, the skin having previously been removed. Specimens are occasionally met with, weighing three quarters of a pound.

From a *living specimen* seven inches in length, the following account is drawn up. Color fuliginous, darker upon the head and back, approaching to black; lighter upon the sides, tinged with cupreous; white beneath, in front of the ventrals. Length of the head to the entire length of the fish, as 1½ to 7. Greatest width of the head, equal to one seventh the length of the fish; greatest depth of the fish, more than equal to one seventh the length of the fish. *Head* flattened above; upper jaw longer than the lower; both furnished with numerous small teeth; eight cirrhi about the head. From the angle of the upper jaw on each side, one projects, an inch and a half long, tapering to a point; another, three quarters of an inch long, back of and above this; beneath the lower jaw, are also four cirrhi, two on each side of its middle; the outer, one inch long; the inner, three quarters of an inch long. All these cirrhi are of the same color. *Eyes* small, one line in diameter; the distance between the eyes equal to about half the length of the head. Two blunted spines on the humeral bone; the upper, much the smaller. The *lateral line* arises above the posterior angle of the operculum, and runs nearly a straight course to the tail.

The Dorsal fin arises about half an inch back of the pectorals; length to height as 1 to 2. A small adipose fin a short distance in front of the tail.

The Pectorals are situated a short distance in front of the posterior angle of the operculum; length to height as 3 to 12; their outer ray is spinous, and serrated upon its outer edge; it is marked at its point, and is three lines shorter than the first fleshy ray.

The Ventrals arise on a line just back of the dorsal fin; length to height as 4 to 9. Anus large, oblong, between the posterior half of the ventrals.

The height of the Anal fin equal to half its length.

The length of the Caudal almost equal to its height. All the fins are dark colored.

The fin rays are: D. 1–5; P. 1–8; V. 8; A. 21; C. 19.

In the dead fish, the dark coloring matter readily *rubs* off; and the specimen, if untouched also, rapidly becomes of a lighter color.

In one specimen I have seen, a large black blotch was situated just beneath the lower jaw, and the whole interior portion of the lower jaw, including the teeth and far back of them, was colored with a deep black pigment.

Family IV.

SALMONIDES.

Salmo. Lin.

Generic characters. *Head smooth, covered with scales; two dorsal fins, the first supported by rays, the second fleshy, without rays; teeth on the vomer, both palatine bones, and all the maxillary bones; branchiostegous rays varying in number, generally from ten to twelve, but sometimes unequal on the two sides of the head of the same fish.*

S. *salar.* Lin. *The Salmon.*

Pennant's British Zoology, vol. iv. 249 et fig.
Mc Murtrie's Cuv. vol. ii. 222.
Yarrell's British Fishes, vol. ii. p. 1. fig.
Strack's plates, 123. 1 & 2.

The building of dams and manufacturing establishments, by preventing the fishes from going up the rivers to deposit their spawn, has almost entirely annihilated this species in our State. Forty-five years since, it was very abundant in the Merrimac river, so much so that nine individuals have been taken in an afternoon by one person with a dip net; and the usual price was *eight cents* per pound. About seventeen years since, two wagons, each bringing from 30 to 40 fine salmon from the Merrimac river, supplied the Boston market every week during the season of the fish. Now the few specimens taken are looked upon as rarities, and our market is supplied by the fishery of the Kennebec. The average weights of the Merrimac salmon are from 9 to 12, and from 16 to 22 pounds. The largest weigh from 30 to 40 pounds. They have been caught during every month in the year. The greatest run of *salmon*, up the river, is about the first of June. The fishermen say the young salmon are never seen on their return.

The price of this species of late years in our market, varies exceedingly, from $2 to 20 cents per pound. The largest specimen, so far as I can learn, that has been sold in Boston market, weighed 34 pounds; and the greatest price ever received for one fish, in the same market, was $50.

The following description is drawn up from a specimen thirty inches in length, and weighing eighteen pounds: Its width across, from the commencement of the dorsal fin, is eight inches; its greatest depth three inches and a half. Of a beautiful, brilliant, bluish silver color above; lighter upon the sides; white beneath; black blotches upon the sides, much more numerous above the lateral line, for the most part surrounding the outline of the scales, leaving the color of the bodies unchanged; the spots upon the scaleless head are unbroken, and of a deeper color. Length of the head equal to one fifth the length of the fish. *Head* naked, sloping, darker colored above than the back of the specimen. *Gill-covers* light silver colored. *Eyes* small; pupils black; irides silvery. Diameter of the eye equal to one quarter the distance between the eyes. *Nostrils* placed vertically, much nearer the eyes than the extremity of the snout. Upper jaw the longer, receiving into a notch, at its middle, the prominent tip of the lower jaw; both jaws armed with a few sharp incurved teeth, as well as the palatine bones, vomer and tongue. Inside of the jaws and edges of the tongue, dusky. The *lateral line* is nearly straight.

The first Dorsal fin commences upon the anterior half of the body; its first rays are equal in height to the length of the fin. Fin rather darker colored than the back, and with one or two longitudinal rows of black blotches upon its base. The adipose fin is dark brown, situated a short distance in front of the tail; its length is equal to one third of its height.

The Pectorals arise in front of the posterior angle of the gill-covers; above they are dark colored; beneath lighter; length equal to one fourth their height.

The Ventrals are above dusky; beneath white; they begin on a line opposite the middle of the dorsal fin, and have on their sides a large axillary scale.

The Anal fin is white; higher than long. The Anus is large, and edged by the extremities of the surrounding scales.

The Caudal fin is of a dark brown color; the fleshy portion of the tail extends considerably farther forward in its middle than on the sides, leaving the caudal rays much longer upon the sides of the tail; the length of the central caudal rays only one third the length of the lateral rays.

The fin rays are as follows: D. 12; P. 15; V. 9; A. 10; C. 19.

S. *fontinalis*. Mitchell. *The common brook Trout.*

Trans. Lit. et Philosoph. Soc. v. i. p. 435.
Richardson's Fauna, p. 176, et fig.

This is quite a common species in our market, and meets with a ready sale. Dr. Mitchell speaks of it as being highly esteemed in New York.

Of twelve specimens before me, the largest is eight inches in length. The upper part of the body is of a pale brown color, mottled with darker undulating, reticulating markings ; the sides lighter, with a great number of circular yellow spots, varying in their size from a small point to a line or more in diameter ; and many of them having in the centre a bright red spot ; sometimes, the yellow color surrounding them having partially disappeared, they seem distinct from the circular spots, or are surrounded by a dull bluish halo ; these red spots differ exceedingly in number ; in some specimens, three or four only are observable, and these are situated below the lateral line ; in others, twenty or more are seen scattered above and below the lateral line indiscriminately, presenting a beautiful appearance. *Body* beneath whitish, slightly fuliginous. Length of the head to the whole length of the body, as 1 and 1-2 to 7 ; top of the head slightly flattened ; the snout obtuse. *Head* above, darker colored than the back. *Gill-covers* golden, with fuliginous. *Eyes* large, pupils black, irides silvery. Distance between the eyes, equal to one fifth the length of the head. *Jaws* equal in length; gape of the mouth large; teeth sharp, recurved; teeth on the tongue larger than those in the jaws; teeth also on the palatines and vomer. Scales very small; those on the lateral line, which pursues a straight course, larger than those on the rest of the body.

The Dorsal fin is situated upon the anterior half of the body; it is yellow, with irregular black transverse bands; longer than high; the adipose fin is quite small near the tail.

The Pectorals arise in front of the posterior angle of the operculum; its length equal to one quarter of its height. The first ray white; the second ray dark colored; the remainder of the fin red.

The Ventrals commence opposite the middle of the dorsal fin; when unexpanded, their extremities, together, form a sharp point. As in the pectorals, the outer ray is white; the second dark; the remainder red.

The Anal fin arises in front of the adipose fin, and is higher than long.

The Caudal fin is of a dirty reddish brown, mottled with black spots; slightly bifurcated.

The fin rays are as follows: D. 11; P. 13; V. 8; A. 11; C. 19.

November 5th, 1838. I have just received three beautiful specimens of *Trout*, from Dr. Forsyth, of Sandwich, which are commonly called "*Salmon Trout*," and, as such, are sought for with great avidity; they are taken there in considerable quantities; not less than 1000 pounds yearly. It is quite common to find them in the wells of the vicinity of Sandwich, living for years, and attaining a large size. These Sandwich fish are really delicious, as my good friend has given me an opportunity of testing at my table; still, upon a careful examination, they answer most perfectly to Mitchell's description of the "*fontinalis*," and do not at all correspond with the descriptions of the "*salmo trutta*," *salmon trout*. The largest of my three specimens is fifteen inches in length, nearly as large again as this species is usually met with in our market from the neighboring brooks; and they not only differ somewhat in appearance from the smaller specimens, but also from each other. Thus, in one of the specimens before me, the abdomen, between the origin of the pectorals and the ventrals, is a pure white; in a second, it is a yellowish white; and in the largest, the whole extent of the lower portion of the sides, is a beautiful orange color, and the abdomen a dark fuliginous.

OSMERUS. Artedi.

Generic characters. *Body elongated, covered with small scales; two dorsal fins, the first with rays, vertical line under the commencement of the first dor- the second fleshy, without rays; ventral fins in a sal fin; teeth on the jaws and tongue very long, two distinct rows on each palatine bone, none on the vomer, except at the most anterior part; branchiostegous rays* 8.

O. *eperlanus*. Artedi. *The Smelt.*

Pennant's British Zoology, vol. iii. p. 273, et fig.
Yarrell's British Fishes, vol. ii. p. 75, et fig.
Journal Academy Nat. Sciences, vol. i. p. 230.
Fauna Boreali-Americana, p. 185.
Strack's plates, 128. 1.

This beautiful species is brought to our market in the spring and autumn in large quantities, and is highly esteemed as an article of food. In the spring, it is taken in nets up the rivers, and in winter, with the hook beneath the ice. In Watertown alone, about 750,000 dozen are taken annually in scoop-nets, from the *first of March to the first of June*, and sent to Boston market. It is generally taken from four to ten inches in length. The largest specimens I have seen were taken in Milton river, the latter part of December, 1837. Four specimens, taken without regard to size, weighed one pound and a half.

The length of the specimen before me is nine inches. Length of the head, one inch six lines. Color, above the lateral line, yellowish green; all the body beneath the lateral line, a silvery white; portions just beneath the lateral line presenting the appearance of a satin band, the length of the body. Lower jaw longer than the upper. *Mouth* wide. Maxillary bones toothed throughout their whole extent; teeth in the jaws strong, crooked. Three or more teeth on each side of the tongue; a tooth at the extremity of the tongue, much longer than the others. *Nostrils* very large. Diameter of the eye nearly three lines; pupils black; irides silvery. The *lateral line* commences at the posterior angle of the operculum, and passes on in a straight course to a line within half an inch of the dorsal fin, where it can be scarcely discovered.

The Dorsal fin is brownish; its length equal to half its height. The adipose fin is two inches back of the dorsal, slightly curved, two lines in length.

The Pectorals are six lines long, commencing on a line with the beginning of the lateral line.

The Ventrals commence two and a half inches back of the base of the pectorals.

The Anal fin is two inches back of the ventrals; height of the longest rays equal to rather more than half the length of the fin.

The Pectoral, Ventral and Anal fins silvery, like the abdomen.

The Caudal fin is six lines back of the adipose fin, somewhat forked.

The fin rays are: B. 8; D. 11; P. 14; V. 9; A. 15; C. 19.

In the first volume of the "*Journal of the Academy of Natural Sciences*," Le Sueur described this as a new species, under the name of "*viridescens.*" *Cuvier* does not acknowledge his to be distinct from the European fish, and therefore "*Artedi's*" name has the priority.

SCOPELUS. CUV.

Generic characters. *Body long, slender; the principal dorsal fin over the interval between the ventral and anal fins; a second dorsal fin, so small as to be scarcely perceptible; the head short; the*

mouth and gill-aperture large; small teeth on both jaws; palate and tongue smooth.

S. ***Humboldtii.*** Cuv. ***The Argentine.***

Pennant's British Zoology, vol. iii. p. 286, et fig.
Yarrell's British Fishes, vol. ii. p. 94, et fig.
Mc Murtrie's Cuv. vol. ii. p. 232.

The only specimen I have met with of this beautiful little species, which is neither mentioned by Mitchell in his "*Fishes of New York*," nor by Richardson in his "***Fauna Boreali-Americana,***" was brought from Nahant, by Mr. Jonathan Johnson, of that place. He found it in December, 1837, ***alive*** on the beach; he had never seen a ***living*** specimen before, but had repeatedly found partially decomposed specimens in the stomachs of haddock.

The entire length of my specimen is two inches one line: length of the head, three lines. The back, to the depth of about a line, is of a dark green color; the sides, including the gill-covers, are of a beautiful silvery lustre. A row of brilliant circular metallic colored spots runs along the belly, from before the pectorals to the anus; higher up, on the sides, another row of dots parallel with these; behind the anus a single row of smaller dots of a similar character, is continued to the base of the tail. ***Body*** very much compressed. The *lateral line* almost imperceptible, nearly straight, commences at the upper third of the operculum. *Mouth* widely cleft; teeth small in both jaws. *Eyes* large, one and a half line in diameter; irides silvery.

The fin rays are: D. 10; P. 17; V. 8; A. 15; C. 19.

FAMILY V.

CLUPEÆ.

CLUPEA. Lin.

Generic characters. *Body compressed; scales large, thin, and deciduous; head compressed; teeth minute or wanting; a single dorsal fin; abdominal line forming a sharp keel-like edge, which in some species is serrated; branchiostegous rays* 8.

C. *elongata.* Le Sueur. *The common Herring.*
Journal Academy Nat. Sciences, vol. i. p. 234.

This species which is known in our market as the "*English herring*," was described by Le Sueur in the "Journal of the Academy of Natural Sciences," under the specific name of "*elongata.*" In some seasons this fish is taken in great numbers. The quantities of *herring* packed and inspected, according to tables kept at the general inspection office for five years, are as follows: 1832, 52 bbls.; 1833, 36; 1834, 518; 1835, 963; 1836, 77. That a small quantity only of the *herring* taken, is packed, is obvious, from the fact, that in 1836, 500 bbls. were taken at Falmouth; 400 bbls. at Duxbury, and 3000 at Martha's Vineyard.

Upon some portions of our coast, *herring* have been limited in quantity for the last few years, and during the years 1835 and 6 very few, comparatively speaking, were taken. Their scarcity has been attributed by the fishermen to *torching* them at night, by which the shoals are broken up, and the fish frightened away.

The specimen lying before me, is thirteen and a half inches in length. Color upon the back of a deep blue tinged with yellow; sides paler; opercula, yellow tinged with violet; beneath, silvery. Scales large, silvery, deciduous. Abdominal ridge indistinctly serrated; about thirty spines may be counted in front of the ventrals, and fifteen behind them. Depth of the specimen at the origin of the dorsal fin, one fourteenth the length of the body; width at the commencement of the dorsal fin a little more than one seventh of the length. Length of the head when the mouth is closed, from the extremity of the lower jaw, about one seventh of the whole length of the fish. *Head* destitute of scales, a depression upon its top, between and back of the eyes, exhibiting numerous mucous pores. *Eyes* large and provided with a nictitating membrane; pupil black, irides silvery; distance between the eyes double the diameter of the eye. *Nostrils* equidistant between the eye and the snout. Gape of the *mouth* large. *Jaws* furnished with teeth; palate and tongue also provided with teeth.

The Dorsal fin longer than high.

The Pectorals less than one third as high as long.

The Ventrals are situated opposite the middle of the dorsal fin.

The Anal is more than one third as high as long; its anterior half, the higher.

The Caudal fin is forked; at its base, width to the width of the expanded extremities as 1 to 2.

The fin rays are: D. 18; P. 19; V. 9; A. 18; C. 22.

Le Sueur describes the iris as "*reddish*;" he probably saw his specimens after they had been some time taken. The iris of most fishes changes to a *brown* very soon after death.

C. *fasciata.* Le Sueur. *The fasciated Herring.*

Journal Academy Nat. Sciences, vol. i. p. 233.

For a long time, I supposed I had seen specimens of this species in Boston market, with the "*Alosa vernalis*," but now think I may have been mistaken. Not having seen an individual, however, since the description of our fishes was undertaken, which answers to the species of Le Sueur, I have no alternative left me, but to copy his account.

"The species which I call *Clupea fasciata*, (fasciated Herring,) is known under the name of *alewive* by the fishermen of Sandwich, and appears only in the spring; but about the end of August, 1816, we still had a sight of several individuals, in length one, two, four, eight, and nine inches, all alike, except as to size. Body compressed; back straight; breast and abdomen forming a bow downwards as far as the tail; seven to eight lines of a blackish blue at the sides of the back, and a rounded notch at the bottom of the divisions of the tail, of which the lower lobe is the longest. The entire length of the body is about six times that of the head, which is not equal to the depth of the body; snout short; jaws equal; maxillars of middling width, scarcely reaching beyond the centre of the eye, which is near the end of the snout, and round, its iris yellow, and pupil black. *Operculum* parallelogramiform, slightly oblique, and depressed at the lower edge; *dorsal* as high as the width of its base; *pectorals* acute, rather long; *ventrals* somewhat behind the front of the dorsal, which is large and truncated; *anal* long, subequal; *lateral line* scarcely visible; *color* blue on the back, lighter at the sides, and of a silver white under the abdomen, breast and tail; yellow tints are reflected from the scales upon the opercula, base of the tail and fins. The *blue lines* are deeper towards the back than the abdomen, where they disappear.

These are salted, and taken with the seine.

B. 7; D. 18; P. 16; V. 9; A. 18; C. 22 6–6 rays."

C. *minima*. Peck. *The Brit.*

Belknap's History of New Hampshire, vol iii. p. 130.

This pretty little species, *named* but not described by Peck in "Belknap's New Hampshire," is found at some seasons of the year in incredible numbers upon our coast, and serves as food for several other species. It varies in its length from one to four inches. *Back* nearly black; upper part of the sides dark green; *sides* silvery, with roseate and golden reflections; in the younger specimens, the dorsal ridge is a black line, and the distance between it and the lateral line, which is situated very high upon the sides, is of a light green sprinkled with darker points. The *lateral line* arises upon a line with the upper angle of the operculum, and runs along very near the back, the length of the body. The *abdominal ridge* is serrated. Length of the *head* one fourth the length of the body, gradually sloping from the occiput to the snout; top of the head darker colored than the rest of the body. *Gill-covers* large, silvery, seeming to form one large plate. *Lower jaw* rather projecting beyond the upper. Diameter of the *eye* equal to one sixth the length of the head. *Tail* forked.

The fin rays are: D. 10; P. 15; V. 5; A. 12; C. 18.

ALOSA. Cuv.

Generic characters. *Upper jaw with a deep notch in the centre; in other respects like the Clupea.*

A. *vernalis.* Mitchell. *The spring Herring or Alewive.*

Although in several portions of the state where the *alewives* have heretofore been most abundant, the various encroachments of man have sensibly diminished them, they are still taken in some places in immense numbers. A larger quantity of *alewives* is packed than of any other species of this family. In 1832, 1730 barrels were inspected; 1833, 2,266; 1834, 4,320; 1835, 5,600; 1836, 5000.

At Watertown, the average quantity of alewives for the last ten years, is 700 barrels. They are first pickled, then salted and barrelled, and sent to the West India Islands. They sell for from $1.50 to $2.00 per barrel. At Taunton, which for years was so celebrated for its fishery, the *alewives* are gradually lessening. There are two or more dams across the Taunton "*Great River*," so called, which impedes their progress very much; and on the "*Little River*," where many dams and factories have been erected, and where, twenty years ago thousands were taken, not one now is to be seen. Twenty-five years since they were taken in such abundance at Taunton, that they sold for 20 cents per hundred, and a great business was carried on in barrelling and shipping them to the West India market. At the present time, when first taken, they sell for 100 cents per hundred, and, as the season advances, diminish gradually in price to 50 cents. Most of the fish are disposed of at the seines, (fresh,) and *cured* by the purchasers. In the Merrimack river too, they have been diminishing in number for the last five or ten years; the fishermen think this is because the small ponds emptying into the river have been dammed up. A pond in Manchester and Chester was formerly famous for its *alewives*.

The following characters are presented by a specimen of this species: Color on the back bluish purple; sides a light cupreous; beneath silvery; on the sides, four or five, and sometimes even more, indistinct greenish lines passing from the head to the tail; these lines are quite obvious when looked at from either extremity of the fish, the eye being placed on a line with the fish. Length of the fish to its width, about as 4 to 1; length of the head to the entire length of the body as 2 to 12. Depth of the body, in a specimen twelve inches long, across the anterior base of the dorsal fin, three inches; across the base of the pectorals, two and a half inches; across the anus, two inches. *Head* small; opercula golden, and marked with beautiful arborescent ramifications. *Eyes* large; pupils black; irides silvery. *Mouth* very large. Lower jaw slightly longer than the upper; upper jaw notched in its centre. Just back of the upper posterior angle of the operculum, a deep black blotch. Scales on the body very large and deciduous. The whole of the abdominal edge strongly serrated by projecting bony spines; these serrations are larger, back of the ventrals, between them and the anus.

The height of the Dorsal fin equal to its length.

The width of the Pectorals at base, to the length of the fin, as 4 to 12.

The Ventrals darker colored than the abdomen, and of a moderate size.

The height of the first rays of the Anal fin to the length of the fin, as 5 to 15.

The Caudal fin deeply notched; width at the base when unexpanded, to the width at the extremities, as 1 to 2.

The fin rays are as follows: D. 17; P. 15; V. 9; A. 18; C. 21.

A. *vulgaris*. Cuv. *The common Shad.*

Mc Murtrie's Cuv. vol. ii. p. 235.
Yarrell's British Fishes, vol. ii. p. 136.
Strack's plates, 129. 1.

This excellent species is brought to Boston market from the mouths of the neighboring rivers, in considerable quantities, in the spring of the year, and meets with a ready sale. At first they sell for 50 cents a piece ; as the season advances, for 25 cents; and at last may be bought for about 12 1-2 cents. Many of this species are also packed. In the year 1832, 100 barrels were inspected ; 1833, 321 ; 1834, 3 ; 1835, 310 ; 1836, 527. The quantities taken in Charles river, at Watertown, for the five years preceding 1838, averaged about 6000 per annum. From 3000 to 4000 are yearly caught at Taunton. In the Merrimack river this fish was very scarce forty-five years ago, and remained so for about five years. At this time there were ten salmon to one shad. Very few were caught. Before that time they had been very abundant. It was said that 10,000 were caught at one haul. After the scarcity, they became plentiful, and continued so till about 1810, when they were scarce again for two or three years. They then became plentiful, and still continue so. They have not decreased for the last ten years. *Shad* and *alewives* go up the river during the whole of May. Their greatest run is when the apple trees are in full blossom. The *old shad* return in August ; the *young*, three or four inches long, in September. These are very fond of flies. The Concord river water is said to be warmer than that of the Merrimack, and the Concord shad were caught a month earlier than those of the Merrimack above its junction with the Concord. The Concord shad have almost entirely disappeared, their ascent having been cut off by dams.

The usual weight of this species is from one to four pounds, although it sometimes attains six pounds. Color upon the top of the head and the back, bluish; the upper portion of the sides, including the opercula, cupreous; beneath silvery. Whole body covered with large, deciduous scales, with the exception of the head, which is naked. *Eyes* large; pupils black; irides silvery; the diameter of the eye equal to the distance between the eyes. *Nostrils* nearer the anterior angle of the eye than the snout. Upper jaw notched in its centre; its lateral edges slightly crenated. Length of the head to the whole length of the body as 1 to 6; the greatest depth of the body equal to nearly two thirds the length of the head; the width across the body, from the commencement of the dorsal fin to the anal, nearly one fifth the length of the fish. Abdominal ridge serrated throughout, from the inferior angle of the operculum to the anus; the serrations more prominent back of the ventrals. At the posterior angle of the operculum, a black blotch of considerable size; in some specimens very indistinct until the scales are removed, when it is very obvious.

The Dorsal fin, which shuts into a groove, is situated on the middle of the dorsal ridge; the height of the first rays is equal to two thirds its length.

The Pectorals silvery; their length equal to about one third their height; all the rays, save the first, are branched.

The Ventrals are situated opposite the middle of the dorsal.

The Anal fin is also received into a groove; its fourth ray, which is highest, is less than one third the length of the fin.

The Caudal fin is deeply forked; its depth at the base is to the depth of the expanded extremities as 2 to 5; two membranous appendages on each side, near the centre of the fin.

The fin rays are: D. 19; P. 16; V. 9; A. 20; C. 20.

A. *menhaden.* Mitchell. *The Menhaden. Hardhead, &c. &c.*

Trans. Lit. et Philosoph. Soc. vol. i. 453.

This species, which is known by the names of "*Menhaden,*" "*Pauhagen,*" "*Hardhead,*" &c. is met with in very great numbers, coming into Massachusetts Bay, about the middle of May, and leaving it in November, and is an exceedingly valuable fish. It is taken in large quantities upon various portions of our coast, is used as *bait for other fishes,* and as *manure;* and it is also becoming *an article of commerce.* As *mackerel bait,* it is worth from $2 to $4 per barrel, in proportion to the demand. At Lynn, in 1836, 1500 barrels were used as bait for other fishes, and as many more were thrown upon the land. At Provincetown, they are used only for mackerel bait. The fishermen who supply Boston market with cod fish, set their nets about the outer islands in the harbor, each night, as they come up to the city, and examine them in the morning, as they go out for the day's fishing. Large numbers are thus taken; and such as are not used as bait, are sold to the poorer classes as food, for about 6 1-4 cents per dozen. It is also considered a very good bait for *halibut.* Being a very oily fish, it is valuable as *manure.* It is computed that a single menhaden of ordinary size, is equal, in richness, to a shovel-full of barn-yard manure. In some places they are taken for this purpose only, by trailing nets towards the shore. At Sandwich, where they are very abundant, the inhabitants strew them upon their lands by the cart-load; and thus, for miles, immense quantities enrich the soil. From the following extract of a letter from my friend Dr. Forsyth, some idea may be formed of the numbers used. His letter is dated November 8th, 1837. "For two or three miles below me, on the Barnstable road, the stench from the decomposing fish was a great nuisance to travellers passing along the road, so much so that I feared they might be instrumental in the production of disease; but whether they were so or not, I am not now prepared to say; but certain it is, there have been more cases of *autumnal fever* and *dysentery* this season, in that district, than in all the rest of the town." Upon some portions of Cape Cod, *menhaden* are sold to the farmers for $1 per thousand for manure; they average about one pound each, and 2500 are considered a proper quantity for an acre. This species is getting likewise to be thought worthy of preservation as an article of *food*. In 1832, 300 bbls. were inspected; in 1833, 480; 1834, 1008; 1835, 1443; 1836, 1488. This fish attains the length of fourteen inches. My description is drawn up from a specimen eleven inches in length. Its width, at the commencement of the dorsal fin, three inches. All the upper part of the body of a greenish brown color; sides lighter, mottled with indistinct bluish ocellations; abdomen whitish, serrated; whole surface of the fish iridescent. A large black blotch just back of the upper posterior portion of the operculum. Length of the head three and a half inches. *Gill-cover* very large, all its portions more or less golden. Operculum marked with quite a number of deeply marked striæ, which commence just beneath a large green blotch, situated some distance back of the eye on a line with it, and pass obliquely backward and downward to its lower edge; sub-operculum and inter-operculum smooth; preoperculum presents an arborescent appearance of vessels upon its surface. *Eyes* moderate in size; pupils black; irides golden. Gape of the mouth very large; lower jaw shorter than the upper; the middle of the upper jaw presenting a deep emargination. Back slightly arched.

The Dorsal fin arises upon the anterior half of the body; it is nearly as long again as high; at its base is a membranous prolongation, by which it is partially covered when at rest.

The length of the Pectorals to their height is as 1 to 4; the upper four rays much longer than the remainder. Outside of the fin is an axillary plate more than two thirds the length of the fish; a broad scaly shield at the base of the pectorals covers more than half an inch of their inferior edge.

The Ventrals commence on a line opposite the origin of the dorsal fin; on each side of them is an axillary plate.

The Anal fin commences some distance back of the dorsal; its height to its length is as 1 to 3.

The Caudal fin is deeply forked; the depth of the fin at the base, when unexpanded, to the length of the outer rays, is as 1 to 3; the distance between the expanded extremities equal to the length of the outer rays.

The fin rays are: D. 19; P. 15; V. 7; A. 20; C. 27.

ORDER III.

MALACOPTERYGII SUBRACHIATI.

FAMILY I.

GADITES.

MORRHUA. CUV.

Generic characters. *Body elongated, smooth, compressed towards the tail; back furnished with three dorsal fins; ventral fins pointed; abdominal line with two fins behind the anal aperture; the lower jaw with one barbule at the chin; branchiostegous rays 7.*

M. *Americana.* Nobis. *The American Cod.*

Whether the "*Morrhua vulgaris,*" the common Cod, of European writers, is ever taken in the waters of Massachusetts, I am unable to decide. Dr. Mitchell says it is taken "in the sea near Nantucket, and beyond." Certain it is, I have never seen it in Boston market; and Mr. Newcomb, senior, the oldest fishmonger in our market, who has repeatedly been at the Banks of Newfoundland fishing, assures me, he never knew the *bank fish* to be caught in our waters. Our fish is the species which Mitchell considers the "M. *callarias*," Lin. Richardson thinks "this is probably a distinct species." From Richardson's guarded manner of speaking, I should judge he had never seen a specimen of our species. The *much larger size* of our fish, the length of the "*callarias*," according to Yarrell, being only "from twelve to twenty-four inches," which cannot be accounted for by mere difference of locality, without dwelling upon points of minor importance, convinces me that our fish is a distinct species, for which I would propose the name of "*Americana*."

This species is taken along the whole coast of the State, throughout the year, leaving the vicinity of land in the month of February, and going off to deeper water. There are several varieties, differing in their color and markings, probably produced by difference of locality or food, which are known by the names of "*Rock Cod*," "*Shoal Cod*," &c. &c.

The cod grows to a very great size. Yarrell states, that the largest cod of which he has any record, weighed *sixty* pounds. Pennant refers to one weighing *seventy-eight* pounds. Mr. Jonathan Johnson, Jr., of Nahant, informs me he has seen taken a specimen weighing *eighty-eight* pounds; and Capt. Nathaniel Blanchard, of Lynn, tells me he has seen a cod weighing *eighty-six* pounds. Both these gentlemen are experienced fishermen, distinguished for their habits of accuracy and veracity; and I take much pleasure in here acknowledging the *great assistance* rendered me by them, in the prosecution of my task. The largest specimen of which I have ever heard, Mr. Anthony Holbrook, a fishmonger in

Quincy market, informs me he saw taken in the spring of the year 1807, at New Ledge, sixty miles southeast of Portland, Me.; it weighed *one hundred and seven* pounds; and, to use his own words, "upon its head were barnacles the size of his thumb."

To Massachusetts, the cod fishery is exceedingly important, supplying our markets with an excellent food throughout the year, and giving employment to thousands. In some portions of the State, this fishery is entirely superseded by the taking of *whales.* Thus, while every town in the county of Barnstable is more or less engaged in this business, and collectively they exhibit an aggregate of 212 vessels, *but a single fishing-smack* was licensed in Duke's county, in 1836, and *not one* in the county of Nantucket; the attention of the inhabitants of the last two counties being entirely engaged in whaling. I have ascertained that in 1836, there were engaged in the cod fishery, from Gloucester, Marblehead, Provincetown, South Wellfleet, Cohasset, Duxbury, Plymouth, Manchester, Salem and Beverly, being *ten* towns, 561 vessels, having crews of 3816 men; and that by these vessels there were taken 263,454 quintals of fish. To these may be added the towns of Newburyport, Lynn, Falmouth, Holmes Hole and Sandwich, (in which I have not been able to learn the number of vessels exclusively employed in this fishery,) which furnished, in 1836, 16,265 quintals; thus exhibiting 279,718 quintals of cod fish taken by the enterprise of the citizens of fifteen towns. When it is observed, that about 3500 of the cod fish from the Grand Bank, (which are generally much larger than those from the Straits of Belleisle,) constitute *one hundred quintals*, some conception may be formed of the immense number taken. At the usual price of these prepared fish, the above mentioned number of quintals would sell for $839,154.

In 1837, according to the returns of the assessors of the several towns, it appears that there were taken 510,554 quintals of cod fish, which were valued at $1,569,517. These fish were distributed among the following counties: *Essex Co.* took 159,424 quintals, valued at $501,363; *Barnstable Co.*, 134,758 = $392,930; *Suffolk Co.*, 127,250 = $408,510; *Plymouth Co.*, 64,172 = $193,664; *Norfolk Co.*, 15,950 = $46,050; *Middlesex Co.*, 9000 = $27,000.

Besides these *fishing vessels* which go to the *Banks* for the Cod and their bounty, a great number of *boats* are constantly employed in supplying the markets with *fresh fish*. Thus, at Duxbury, in 1836, there were ten market boats having forty men on board, which took from 38,000 to 40,000 fish. At Provincetown, there were *ten boats* thus engaged. Boston market is supplied with cod fish by about fifteen or twenty small schooners, and a large number of boats. By the kindness of Capt. Nathaniel Blanchard, of Lynn, master of one of these smacks, I am enabled to furnish the following table, by which some idea may be formed of the amount of *fresh cod fish* brought to our market. He has presented me the result of his labors with a vessel of 25 tons, and a crew of six men, for nearly five months, commencing October 24, 1836, and terminating

March 20, 1837. His account exhibits the number of fish taken, and the price obtained for the same, for each day during that period. From this minute statement I am able to ascertain that the *largest quantity* taken any one day, was 7124 pounds, December 13th, which sold for five shillings per hundred = $59.39.

The *smallest quantity* taken any one day, was 337 pounds, January 16th, which sold for 12 shillings = $6.67.

The *smallest receipts* were March 20th, when 359 pounds taken, sold for 10 shillings 6 pence = $5.92.

The whole number of pounds taken during the period mentioned, was 194,125.

The entire receipts for the same, were $3026.14.

Besides the value of the fishes themselves, in a fresh and dried state, large quantities of oil are extracted from their *livers*, which is sold for about $15 per barrel.

The color of the cod of our market is exceedingly variable. In the same stall may frequently be seen specimens with equally obvious spots over their entire surface; or they may be much more perceptible on the sides; or they may be scarcely observed at all; and the entire fish appear of an uniform gray; or again of a beautiful bright red; and I have seen a single specimen which was of a lemon yellow.

The following description is drawn up from a specimen about 23 inches in length. Back ash colored; sides lighter; both back and sides covered with yellowish spots larger and more distinct upon the sides. Beneath, dusky white. Length of the *head* compared to the length of the body, with the exception of the tail, rather more than one third; depth over the base of the pectorals rather more than one fifth the length of the body, without the tail; depth over the anus equal to one fifth the length of the body. Top of the head darker colored than the gill-covers. The pupils of the *eye* black; irides a beautiful silvery. Diameter of the eye equal to one sixth the length of the head; the distance between the eyes nearly equal to one third the length of the head; the distance of the extremity of the *snout*, from a line on a plane with the anterior angle of the eye, equal to one third the length of the head. *Nostrils* double, posterior lower and larger; the *upper jaw* projects beyond the lower; in the lower jaw is a single row of *teeth;* those in the back part of the jaw, large, and incurved; those in the fore part of the jaw much smaller; in the upper jaw a row of large teeth in the back part, with a row of minute teeth back of them; approaching the middle of the jaw, a triple row is observed; at the middle of the jaw, four distinct rows are seen; the front row uniformly large, those behind very small. A single barbule about an inch long at the chin. The *lateral line* commencing above the operculum, makes a very gradual slope upwards, and as gradual a curve downwards, until opposite the anterior third of the second dorsal fin it commences a straight course which is continued to the caudal fin; this line is lighter colored in its whole extent than the body, it is wider and more conspicuous after assuming a straight course.

The first Dorsal arises just back of the pectorals; the second Dorsal is much longer than the first; the third is slightly longer than the first. All the dorsals are of a bluish color, spotted like the body.

The Pectorals are round; their length is equal to half their height.

The Ventrals are situated in front of the pectorals, of the color of the abdomen; the two outer rays of the ventral fins are free, the second ray is the longest.

The first Anal fin is shorter than the second dorsal; the second anal, much shorter; both anals the same color as the abdomen.

The depth of the Caudal fin at the extremities, to its length, as 2 to 1; spotted like the rest of the body.

The fin rays are: B. 7; D. 15–22–19; P. 19; V. 6; A. 22–19; C. 40.

M. *aeglefinus*. Lin. *The Haddock.*

Pennant's British Zoology, vol. iii p. 158.
Trans. Lit. et Philosoph. Soc. vol. i. p. 370.
Strack's plates, 26. 2.
Mc Murtrie's Cuv. ii. p. 244.
Yarrell's British Fishes, vol. ii. p. 153.

Immense shoals of this fish are found on our coast in the spring, and continue through the season until the autumn. Ten years since this species was comparatively rare at Cape Cod; now, it is almost as common there, as in any part of our bay. It is estimated that in the *warm season*, about 12 cwt. of haddock are taken to 1 cwt. of cod fish in Massachusetts Bay; and in the *winter*, about 12 cwt. of cod, to 1 cwt. haddock; but as the haddock fishery is of longer duration, the quantities through the year, will average about the proportion of 3 haddocks to 1 cod. Large numbers are sold in the market; and during the entire summer it is generally eaten by the poorer classes, who are often able to obtain a fine fish weighing several pounds for one or two cents. When taken in larger quantities than they can be disposed of in the market, they are frequently strewed over the earth for manure.

The specimen before me is twenty four inches in length. Length of the head compared to the whole length of the body, exclusive of the caudal rays, as 6 to 20; depth of the body across from the anus, less than the length of the head. Color, above the lateral line, a dark grey, beneath this line, a beautiful silvery grey, with a large, and in many specimens nearly a circular patch, on each side, on a line with the middle of the pectorals, its upper portion generally extending above the lateral line, its larger portion usually beneath it. Back of the *head* very convex; *gill-covers* much lighter colored than the top of the head and snout; *upper jaw* projects beyond the lower; teeth in the upper jaw longer than in the lower, and nearly vertical; a very minute barbule at the chin; posterior *nostril* much larger than the anterior. Longest diameter of the the *eye*, more than one sixth the length of the head, pupils black, irides bluish; the distance between the eyes equal to nearly one third the length of the head. The *lateral line* commencing at a distance above the posterior angle of the operculum, equal to the length of the head, assumes the curve of the body until on a plane with about the middle of the second dorsal fin, from which point it runs on in a straight line to the base of the caudal rays; through its whole course, it is of a jet black color.

The first Dorsal fin commences on a line with the base of the pectorals; its length is three fifths that of the second dorsal.

The second Dorsal commences on nearly the same plane as the anus.

The third Dorsal, the same length as the first.

The Pectorals in length not quite equal to one third of their height.

The Ventrals commence in front of the pectorals; their first two rays free; the second ray, the longer.

The first Anal fin commences back of the second dorsal; the second Anal arises on a line with the third dorsal.

The Caudal fin is very slightly notched.

The dorsal, pectoral, and caudal fins are bluish; the anals the color of the abdomen; the ventrals rather lighter than the anal.

The fin rays are: D. 16–24–20; P. 21; V. 6; A. 26–21; C. 35.

M. *tomcodus*. Mitchell. *The Tom Cod.*

Trans. Lit. et Philosoph. Soc. vol. i. p. 68.

As Cuvier in his notes to the "*Regne Animal*," has introduced Mitchell's specific name, I retain it here. It is to be hoped that Valenciennes, in his continuation of the "*Histoire Naturelle des Poissons,*" will assume the specific name "*polymorphus,*" proposed by Mitchell himself, as being equally appropriate and more scientific.

This very common little species is taken in considerable numbers from our wharves and bridges with the hook, together with the "*Conner,*" "*Flounder,*" "*Sculpin,*" "*Eel,*" &c. &c., in the summer; and through the winter, the market is supplied from the mouths of the rivers, in the vicinity of Boston, where they are taken in dip nets. The amount of *Tom Cod* taken at Watertown alone is estimated at 2000 bushels annually; they are sent to Boston market, and readily disposed of there.

Specimens of this species are seldom obtained exceeding twelve inches in length. The length of the head is to the length of the body, about as 1 to 6; the depth of the fish over the anus, exclusive of the dorsal fin, less than one sixth the length of the body. In color, this species varies exceedingly, generally it is brown, greenish, or yellowish brown, with deeper patches, spots, and blotches; beneath, lighter. *Snout* blunt; upper jaw projecting beyond the lower, a small barbule beneath the chin; *teeth* in the jaws very compact, small, and sharp; those in the upper jaw more apparent; small teeth in the throat. Diameter of the eye equal to half the distance between the eyes; pupils of the eye black; irides golden. *Nostrils* double; anterior the larger.

Fins brown, tinged with red. The *lateral line*, commencing above the operculum, curves gently upwards to the pectorals, and just beyond these fins commencing a straight course, terminates at the base of the caudal rays.

The first Dorsal fin commences opposite the middle of the pectorals; its length is greater than its height. The second dorsal as long again as high. The length of the third dorsal, one fourth less than the length of the second, and less than the length of the first.

The length of tho Pectorals is one fourth less than their height.

The Ventrals are situated in the front of the pectorals; the first two rays are free at their extremities; the second ray the longer; the other rays are united.

The first Anal fin is more than as long again as high; the second fin is shorter than the first.

The Caudal fin is convex.

The fin rays are: D. 13–18–19; P. 17; V. 6; A. 22–18; C. 39.

M. *Minuta*. Lin. *The Poor or Power Cod.*

Yarrell's British Fishes, vol. ii. p. 161 et fig.
Strack's Plates, 27. 1.

A single specimen only have I ever seen of this species, which was taken in Boston harbor; it has been preserved for several years in spirits in the cabinet of the "Boston Society of Natural History," and its colors have undoubtedly somewhat changed. Mitchell, it would seem from his silence, had never seen this species. And Richardson makes no mention of it in his "*Fauna*;" my specimen, however, agrees so well with Yarrell's description of the "*minuta*," that I cannot doubt its identity with that species.

My specimen is eight inches in length; length of the head, two inches; depth of the body across the base of the pectorals, rather less than the length of the head. The *lateral line* commences just above the posterior angle of the operculum, curves slightly over the pectorals, and, a quarter of an inch back of these fins, assumes a straight line, which is continued to the tail. *Snout* obtuse; a line of mucous pores along the intermaxillary bones from the tip of the snout to a line beneath the anterior angle of the eye. *Upper jaw* longer than the lower; jaws furnished with sharp teeth. A cirrhus one fourth of an inch long is suspended from the chin. *Eye* half an inch in diameter, being equal to one fourth the length of the head. *Color* of the specimen above, of a reddish yellow; abdomen, of a dirty white, or rather a yellowish white, covered with innumerable minute black points.

The first Dorsal fin commences just back of the origin of the pectorals; rather higher than long.

The second Dorsal, which is as long again as the first, begins and terminates on the same plane with the anal fin.

The third Dorsal, which is longer than high, is longer than the first dorsal, and shorter than the second.

The Pectorals are an inch long.

The Ventrals are fuliginous; their first ray is shorter than the second, which is the longest ray of the fin, and is separated from it or free at the extremities.

The first Anal fin is directly back of the vent; longer than high. The second Anal is one third shorter than the first.

The Caudal fin is but slightly forked.

The fin rays are: D. 12–19–17; P. 17; V. 6; A. 22–17; C. 20.

MERLANGUS. Cuv.

Generic characters. *The same as those of Morrhua, except that they have no barbule at the chin.*

M. *carbonarius.* Lin. *The Coal Fish.*

Pennant's British Zoology, vol. iii.
Mc Murtrie's Cuv. vol. ii. p. 245.
Yarrell's British Fishes, vol. ii. p. 169.
Fauna Boreali-Americana, p. 247.
Strack's plates, 29. 1.

In Sir Edward Parry's first voyage, it is stated that this species was taken of a very small size on the west coast of Davis' straight. I am not aware that it has been noticed by any other naturalist, as inhabiting the American ocean. It is often met with in our market in considerable quantities, and, as well as the "*purpureus,*" is called, by our fishermen, the "*pollack.*" I have had it prepared in its *fresh state* for my own table, and found it an excellent fish. With the cod, it is salted in considerable numbers. From a specimen three feet in length, weighing thirteen pounds, obtained in Boston market in January, I have drawn up the following description. Length of the head, compared to that of the body, exclusive of the tail, as 1 to 2 1-4; depth of the body over the base of the pectorals, rather less than the length of the head. All the upper part of the body and head, black; beneath the lateral line, the body of a bluish white; the abdomen lighter than the sides. The *lateral line*, which is of a beautiful silvery white color, commences just above the posterior angle of the operculum, and with the exception of a very slight inclination anterior to the space between the first and second dorsal fins, pursues a straight course to the base of the caudal fin. Scales on the head, smaller than those of the body; the lower jaw longer than the upper; the teeth in both jaws small and sharp; more numerous in the upper jaw; the lips purplish; the distance between the eyes less than one fourth the length of the head; the eyes large, prominent; the pupils blue; the irides silvery.

The first Dorsal fin commences at a distance back of the posterior angle of the operculum, equal to about one fourth the length of the head; longer than high.

The second Dorsal has its first rays equal in their height to half its length.

The third Dorsal begins at a greater distance from the second, than the space between the first and second; the height of the first rays of this fin, less than half the length of the fin. All the dorsal fins of a bluish black color.

The Pectorals commence on a line with the posterior angle of tho operculum; their color the same as the dorsals.

The Ventrals commence in front of the pectorals; their depth equal to one third their height.

The first Anal fin commences on a line opposite the interval between the first and second dorsal fins, just back of the anus, and is of the same color as the abdomen; depth to its length as 3 to 8. The second anal commences on a line opposite the last dorsal, and terminates on the same plane with that fin.

The Caudal fin is large; its width at base is to its width at the extremity as 2 to 7, being much forked.

The fin rays are: D. 13–20–20; P. 19; V. 6; A. 24–21; C. 32.

M. *purpureus*. Mitchell. *The Pollack.*

Trans. Lit. et Philosoph. Soc. N. Y. vol. i. p. 370.

Until within a few years, the "*Merlangus purpureus*," "*pollack*," was but slightly prized; and the fishermen had so little demand for it, that they not unfrequently gave it away from their boats. Its useful qualities are beginning to be known and valued, and in several of the interior towns of the state, it is now as readily sold as any other fish. When salted, it was formerly usual to throw it at once into *old brine*, to increase its weight, which it did at the expense of its goodness. It is ascertained that when prepared in the same way as the cod, when intended for dun fish, with proper care and good salt, this is really an excellent fish, and its value is increased from nine shillings to from three to four dollars per quintal. Immense numbers of this species are found in our waters in spring and autumn. To Jeffries' ledge, a fleet of 20 or 30 boats frequently go off, in the fall of the year, and having fastened their craft together and thrown overboard a quantity of bait to entice the fish, capture in a single night from 30 to 40 quintals of *pollack* to a boat.

Length of the specimen described, two feet four inches. Depth of the body across from the anus, exclusive of the dorsal fin, as 1 to 4; upper part of the head and body, of a greenish brown color; sides lighter; abdomen white. *Lateral line* of a grayish color, commencing above the posterior angle of the operculum, and slightly curving over the pectorals to their extremity, pursues nearly a straight course to the middle of the caudal rays. Length of the head about equal to the greatest depth of the body; top of the head between the eyes slightly depressed; head somewhat pointed, when the jaws are closed. *Eyes* large; pupils black; irides silvery, with greenish reflections; diameter of the eye equal to half the distance between the eyes. *Lower jaw* longer than the upper; minute teeth in both jaws; gape of the mouth quite large; *mouth* within, bluish; *tongue* large, fleshy. Posterior nostril quite large. A line of mucous pores on both maxillary bones. *Gill-*

covers silvery; the division between the opercle and preopercle, scarcely distinguishable at first sight; the posterior angle of the operculum obtuse. Body gradually arched to the origin of the first dorsal.

The first Dorsal fin arises opposite the middle of the pectorals, is one third longer than high, and of the same color as the back.

The second Dorsal fin is one third longer than the first; it arises back of the first, at a distance equal to less than one third the length of the first dorsal. The distance between the second and third dorsals, is to the distance between the first and second, as 3 to 1; height of the third dorsal to its length, less than 1 to 3.

The Pectorals arise on a line with the posterior angle of the operculum, some distance beneath it; their length to their height, as 2 to 12; the color, of the dorsal fins.

The Ventrals are very small, in front of the pectorals; the second and third rays longest; fins white.

The Anal fin at its base, the color of the abdomen; above, bluish; arises upon the same plane, and terminates with the second dorsal. The second anal about half the height of the first anal; a narrow white margin at its base, and, like the first, whitish at the tip.

The Caudal fin large, strong, forked; length of the outer rays equal to the distance between the extremities of the fin when expanded.

In smaller specimens, the color above is deeper; the abdomen, reddish.

In two specimens, the rays were as follows:
D. 14–22–21; P. 20; V. 6; A. 22–21; C. 40.
D. 14–19–18; P. 16; V. 6; A. 24–16; C. 36.

MERLUCIUS. Cuv.

Generic characters. *The head flattened; the body elongated; the back furnished with two dorsal fins; the first short, the second long; but one anal fin, also very long; no barbule at the chin.*

M. *vulgaris.* Cuv. *The Hake.*

Pennant's British Zoology, vol. iii. p. 168.
Trans. Lit. et Philosoph. Soc. N. Y. vol. i. p. 371.
Mc Murtrie's Cuv. vol. ii. p. 245.
Yarrell's British Fishes, vol. ii. p. 177.
Strack's plates, 28. 1.

This fish is generally known by the fishermen of Massachusetts as the "*Whiting.*" It is not a little singular, that while our species is really the "*European Hake,*" the "*Phycis Americanus,*" "*Codling,*" is called with us "*old English Hake;*" and the "*Hake*" itself is called the "*Whiting,*" which is a "*Merlangus.*" This species is taken, not however, in large quantities, in our bay, in the summer, upon the cod fishery grounds. When perfectly fresh, it is very sweet and palatable, but so soon becomes soft, that it is kept with great difficulty, and on this account is not much valued.

The good specimen on my table was sent me by Dr. Yale. Length fifteen inches; depth of the body at the commencement of the second dorsal fin, two inches. *Body* elongated; top of the head and upper part of the body, of a dull lead color; sides and abdomen white. The *lateral line*, lighter colored than the upper part of the body, arises above the operculum, and curves slightly in its anterior half, then assumes a straight line to the tail. The scales upon the top of the head, much smaller than those upon the body of the fish. Length of the head equal to about one fourth the length of the body. Preoperculum and maxillary bones of a beautiful shining silver color; the inferior portion of the gill-covers naked; upper portion scaly; scales on the operculum reflecting a beautiful bluish tint. *Eyes* very large; pupils black; irides silvery. Diameter of the eye equal to three quarters the distance between the eyes. At the anterior angle of the eye a bony process is observed; just in front of this process are situated the *nostrils*, which are *double*, the posterior much the larger. A sensible depression on the top of the head between the eyes. Smaller furrows on other parts of the head. The lower jaw the longer; the jaws as well as the palatine bones armed with a row of prominent, sharp, recurved teeth, exterior to which, is a row much smaller. Tip or middle of the upper jaw without teeth. Outer edge of both intermaxillary bones, fuliginous. Jaws within, palatines, vomer, fuliginous. A deep furrow exists in the suborbitar bones, extending from just exterior to the snout in the upper, to the posterior portion of the preoperculum; and beneath the lower, from the chin to the outer angle of the jaw.

The first Dorsal fin, which is short and of a triangular shape, arises just before the posterior angle of the operculum. The distance between the dorsals, equal to one third the length of the first dorsal. The second dorsal quite long; rays large, terminating a short distance in front of the caudal fin.

The Pectorals commence on a line beneath the posterior angle of the operculum; the fourth ray is the longest; length of the fin to its height as 5 to 32.

The Ventrals are yellowish; their length to their height as 3 to 27.

The Anal fin arises on a line nearly opposite the commencement of the second dorsal fin, and terminates on the same plane with that fin.

The Caudal rays are nearly even.

The fin rays are: D. 12–38; P. 13; V. 7; A. 40; C. 30.

This species is very accurately described by Mitchell. The specimen which served for his description was of the same size as that from which the preceding account has been drawn up. The ichthyological student will perceive how much the number of fin rays differs in this species.

Thus, according to *Pennant*, they are: D. 9–40; P. 12; V. 7; A. 39—while *Yarrell* makes them thus: D. 10–29; P. 11; V. 7; A. 21; C. 19—and *Mitchell:* D. 12–38; P. 13; V. 7; A. 41; C. 27.

LOTA. CUV.

Generic characters. ***In addition to the elongated body, with two dorsal fins and one anal fin, possessed by the species of Merlucius last described, may be added, chin with one or more barbules.***

L. *compressa.* Le Sueur. *The Eel Pout.*

Journal Academy Nat. Sciences, vol. i. p. 84.

This species was described by Le Sueur as being received from Northampton. The only specimen I have been able to see was sent me from Keene, N. H. Taken as it was in the Ashuelot river, one of the tributaries of the Connecticut, I do not hesitate to draw my description from it, rather than use that of Le Sueur. My specimen presents the following characters. Color of the back and sides a yellowish brown, variegated with darker brown spots; the gill-covers and snout much darker than the remainder of the body. Abdomen whitish. Length six inches; length of the head one inch; body in front of the first dorsal, cylindrical, beginning to be compressed at the sides at the extremity of the pectorals, gradually becoming more so towards the tail, so that the caudal rays appear a membranous prolongation of the body. The entire surface of the body is covered with very minute scales, looking like *cup-shaped depressions.* The lateral line arises above the operculum, and, quite conspicuous, extends in a straight course to the middle of the fleshy portion of the tail. *Head* very much compressed; *eyes* circular; distance between the eyes one quarter the length of the head. *Nostrils* double; from the back of the anterior nostril, a very minute cirrhus is suspended. *Upper jaw* the longer; to the chin is attached a dark-colored cirrhus, one fourth of an inch long. Jaws and palatines armed with numerous, minute, sharp teeth.

The first Dorsal fin, which is of a lighter color than the body, and variegated with black, is situated the length of the head back of the head.

The second Dorsal, arising one fourth of an inch back of the first, is continued to the tail; upon the lower portion of this fin is a row of dark-colored spots, and its edge is margined with black.

The Pectorals are three quarters of an inch long, and dark colored at their extremities.

The Ventrals are small, color of the pectorals, terminating in a point.

The Anal fin is of the same length as the dorsal, and like it is joined to the commencement of the caudal fin.

The Caudal fin is rounded, colored, and margined like the dorsal and anal fins.

The fleshy texture of the membrane forming the several fins, prevents the rays from being counted.

BROSMIUS. CUV.

Generic characters. *Body elongated; a single dorsal fin extending the whole length of the back; one barbule at the chin; ventral fins fleshy.*

B. *vulgaris*. Cuv. *The Cusk.*

Pennant's British Zoology, vol. iii. 178 et fig.
Yarrell's British Fishes, ii. 197 et fig.

Although Le Sueur's description of a "*Brosmius*," which he calls *flavescens*, from a specimen seen by him at Marblehead, published in the fifth volume of the "*Memoires du Museum d'Histoire Naturelle*," lies before me, I cannot think our common cusk a different species from the European. Our species is commonly taken upon the Middle Bank, with the hook, while fishing for deep-water cod. In the spring of the year it is not unfrequently met with in the Boston market, and does not sell as readily as the cod; in the winter season it is rare, and then sells readily for double the prices of that species. By many, as a *fresh fish* it is considered quite a delicacy; and when *salted*, is thought preferable to the Cod.

The *liver* of this species contains a large quantity of oil, which is sometimes preserved by the fishermen, who consider it an excellent application to a *burned surface.*

The following description is drawn up from a specimen twenty five inches in length, weighing between three and four pounds. *Color* of the body an uniform dark slate; head rather darker than the body. *Head*, one fifth the length of the body; width of the body across the commencement of the anal fin, exclusive of the dorsal fin, equal to one sixth the length of the specimen; width of the head across the posterior angle of the operculum, equal to two thirds its length; the scales on the head present a peculiarly corrugated appearance. ***Mouth***, large. ***Jaws***, filled with sharp, recurved teeth. ***Upper jaw slightly longer than the lower.*** A single barbule under the chin. Diameter of the *eye* equal to one sixth the length of the head; pupils black; irides silvery; distance between the eyes nearly one half greater than the diameter of the eye. Extremity of the upper jaw, maxillary bones, and lower jaw, destitute of scales. The ***lateral line*** commences at a distance above the pectorals, equal to the length of the pectorals, and runs on in a straight line to opposite the thirty-second dorsal ray, then making a gentle curve downwards, passes on again in a straight course to the base of the caudal fin.

The Dorsal fin commences at a distance back of the pectorals, equal to about half the length of the head, and terminates just in front of the tail.

The Pectorals are about half the length of the head, round at the extremities, and as high again as long.

The Ventrals are situated just in front of the pectorals, of the same length as those fins, fleshy, and similar in color to the head.

The Anal fin, which is nine inches in length, is continued to the tail, and nearly joins it. Anus, two thirds of an inch in front of the anal fin.

The Caudal fin is round, and like the dorsal and anal fins, is margined with blue, and edged with white.

The fin rays are: D. 96; P. 23; V. 5; A. 73; C. 35.

In a specimen weighing twenty pounds, the color is brown upon the back, with yellowish sides and white abdomen. In this large specimen the *lateral line* is very indistinct; the *ventrals* are yellow; and the *anal* and *dorsal fins* do not extend so near the tail as in the smaller.

From an examination of a young specimen, this species might be considered as distinct from the European fish. A careful study of all its characters, however, must settle conclusively its identity. The difference between the number of the dorsal and anal rays of that species, as described in the works on ichthyology, and of the fish in our waters, arises undoubtedly from the great difficulty of counting them with accuracy, enveloped as they all are by a thick, fleshy membrane.

PHYCIS. Artedi.

Generic characters. *Body elongated; two dorsal fins, the first short, the second long; ventral fins with a single ray only at the base, afterward divided; chin with one barbule.*

P. *Americanus*. Schn. *The American Hake.*

Trans. Lit. et Philosoph. Soc. N. Y. vol. i. p. 372.

I have no means of seeing the description of this species by Schneider; but as Cuvier, in the notes to his "*Regne Animal,*" observes that Schneider's

"*Enchelyopus Americanus*," and Mitchell's "*Gadus longipes*," are the same fish, I do not hesitate to admit the priority of the specific name of the former. Deceived in my early investigations of our fishes by the plates of the "*Phycis furcatus*," a species taken in the ocean and pretty generally diffused, and the "*Gadus longipes*" of Mitchell, I had supposed the species I am about to describe, as the *Phycis*, and accordingly catalogued it as such in the first volume of this Journal. At that time Mitchell's description was not at my command, to compare with the fish itself, and I was compelled to depend upon his plate. Further research has convinced me how unsafe it is to rely upon plates alone in ichthyology, as well as in the other branches of natural history. Mitchell called it the "*Codling*." As it is generally known by our fishermen as the "*Hake*," I have prefixed that name.

Large numbers of this species are taken between the first of June and the first of September, on muddy bottoms, between Cape Ann and Boston light-house. They are generally taken in the night, with the hook; sometimes 2000 weight, varying in size from 3 to 30 pounds or more, are taken in a single night, by one man, where scarcely a specimen was captured during the previous day.

From a fine specimen three feet in length, weighing nine pounds, I have made the following description: General color of the upper portion of the fish, grayish brown; beneath, lighter. Length of the head to the body, exclusive of the tail, as 9 to 32;

depth of the body in front of the pectorals, six inches; depth across from the anus, exclusive of the dorsal fin, five inches; depth of the body beyond the termination of the dorsal and anal fins, one inch and a half. Top of the head flattened; sides somewhat compressed; *eyes* large, prominent; pupils black: irides silvery; diameter of the eye one inch and a half; distance between the eyes equal to about one fourth the length of the head; *upper jaw* projects beyond the lower; both jaws are armed with several rows of sharp, incurved teeth; *tongue* large and fleshy; a very minute barbule at the chin. The *lateral line*, which is quite obvious, commences above and just anterior to the posterior angle of the operculum, and continues nearly a straight course to the tail, being near the back throughout its whole extent.

The first Dorsal fin commences an inch back of the pectorals; its third ray is higher than the length of the fin, and is the longest ray.

The second Dorsal fin, which commences just back of the first, has its first rays longest; they gradually disappear as they approach the tail. This fin does not extend quite to the tail.

The Pectorals commence just back of the posterior angle of the operculum; their length is to their greatest depth as 5 to 20.

The Ventrals commence at a point just half way between the base of the pectorals and the angle of the lower jaw; composed of a single ray, which bifurcates about its middle; one of its divisions much larger than the other.

The Anal fin arises some distance back of the second dorsal, and terminates on the same plane with that fin; the ten or eleven first rays of this fin are the largest; they diminish as the fin approaches the extremity of the fish; this fin, as a whole, is not as high as the opposite dorsal.

The Caudal fin, in its length, from the extremity of the lateral line, is to its width at the extremity as 3 to 5.

The fin rays are: D. 10–54; P. 17; V. 1; A. 48; C. 21.

FAMILY II.

PLANI.

PLATESSA. CUV.

Generic characters. *Body rhomboidal, depressed; both eyes on the right side of the head, one above the other; a row of teeth in each jaw, with others on the pharyngeal bones; dorsal fin commencing over the upper eye, that fin and the anal fin extending nearly the whole length of the body, but neither of them joined to the tail; branchiostegous rays* 6.

P. *plana.* Mitchell. *The Flounder of Massachusetts.*

Trans. Lit. et Philosoph. Soc. N. Y. vol. i. p. 387.

This fish, which Mitchell calls the "*New York Flatfish,*" is generally known by our fishermen as the "*Flounder.*" It is taken in considerable quantities throughout all the warm season near the shore, from the wharves, bridges, &c., and in the winter is speared through the ice. Those taken about Deer Island are considered very fine, in the market. The largest specimen of the "*plana,*" I have seen, measured in length twenty-one inches, and in width, seventeen inches.

The color is very variable; sometimes the right side, upon which are situated the eyes, is of a rusty brown; sometimes of a dark, blackish brown; at other times, of a dull slate color. Scales small. Surface of the fish, smooth. Left side colorless.

Length of the specimen before me, thirteen and a half inches; length, exclusive of the tail, ten and a half inches; length of the head, two and a half inches; depth of the fish across its middle, less than half the length of the fish, when the tail is included. *Head* covered with scales; *mouth* small; lips large and fleshy; a single row of compact, prominent, slightly incurved teeth in each jaw. The half of the jaw next to the eyes, without teeth. *Eyes* large; their longest diameter six lines; the shorter, four lines; pupils black; irides golden. Space between the eyes, two lines wide, covered with scales. The *lateral line,* commencing at the anterior inferior angle of the under eye, curves backwards and upwards just behind the eyes, until it reaches the upper edge of the gill-covers, when it passes backwards in a straight line to the rays of the caudal fin, curving only very slightly over the pectorals. This lateral line is perfectly smooth.

The Dorsal fin commences anteriorly to the middle of the upper eye, and increasing in the height of its rays towards the middle, decreases from that point gradually towards the caudal fin, a short distance in front of which it terminates.

The Pectorals are situated just beneath the posterior angle of the operculum; their length to their height is as 1 to 4.

The Ventrals, of moderate size, arise on the same plane with the Pectorals.

At the commencement of the Anal fin, a projecting spine is situated, nearly concealed by the flesh.

The Anal fin arises back of the pectorals; its rays increase and diminish again in height like those of the dorsal fin, and the fin terminates on the same plane as the dorsal fin.

The Caudal fin, when expanded, is one third deeper than high.

The rays are: D. 65; P. 10; V. 6; A. 48; C. 17.

P. *ferruginea.* Nobis. *The Rusty Dab.*

Plate II.

This species is occasionally brought to our market, in the winter season only; it is taken in about thirty fathoms of water.

From a fine specimen caught at Cape Ann, and brought to Boston market, Dec. 30th, 1837, eighteen inches in length, and six and a half inches in its greatest depth, the following description is drawn up.

All the right side of the body is of a reddish slate-color, covered with a great number of ferruginous spots; these spots, irregular in their form and size, are scattered alike over the body and head and fins. The left side is without spots, margined at the base of the dorsal, anal, and caudal fins with yellow; this margin is wider and of a deeper tint at the posterior extremity of the body, and is continued on the caudal rays. Length of the head to that of the body without the caudal rays, as 1 to 4; depth, including fins, equal to half the entire length of the fish. *Mouth*, small; *jaws* equal, with sharp teeth compactly set together; *lips* tumid, making the mouth to appear somewhat like that of a "*catostomus.*" *Nostrils*, double. *Eyes* situated exactly over each other, separated by a narrow bony ridge, destitute of scales; longest diameter of the eye, nearly equal to one fourth the length of the head. The *lateral line* commences about the length of the ventral fin above the pectorals, and making a high arch over the pectorals, commences a straight course on a line opposite the twenty-fourth ray of the dorsal fin, and is continued to the extremity of the caudal rays.

The Dorsal fin commences over the anterior third of the upper eye, and increasing in the length of its rays, which are longest towards the middle of the body, and again diminish in their length, terminates about an inch anterior to the rays of the caudal fin.

The length of the Pectorals, one line more than one fourth the length of the head.

The Ventrals commence on a line with the base of the pectorals.

Anterior to the Anal fin is a strong spine which projects forwards, almost concealed by the flesh. The anal fin commences under the posterior third of the right ventral fin, and terminates on a plane with the dorsal fin; the rays of this fin, like those of the dorsal, are longest towards the middle of the fin.

The length of the Caudal fin, one third more than its depth at the base.

The anal, dorsal, and ventral fins on the left side, white, tinged with yellow; pectorals, on same side, white. Fins on the right side edged with white.

The fin rays are: D. 76; P. 10; V. 6; A. 55; C. 18.

The most careless observer would readily distinguish this from the "*Pleuronectes dentatus*," of Mitchell, by its small mouth, fleshy lips, closely set teeth, and arched lateral line.

It more nearly resembles the "*limanda*," Lin. than any other species; so great indeed is its similarity that a minute examination is necessary to decide its difference. In its color; the number of its fin rays; its general size; the curved lateral line; size of the mouth; ridge between the eyes, and several other minor particulars, it agrees pretty well with the description in the books of that species. But in other characters equally important, it differs. The "*limanda*" is very rough on its surface; our fish is perfectly smooth. The color of the former, an uniform pale brown; of the latter, a rusty color with spots of a deeper brown in the recent specimen; in the former, the teeth are separated; in the latter, they are very close to each other, striking when the mouth is closed, upon each other's tops; the length of the pectorals of the former, is nearly two thirds the length of the head; in the latter, it is one line only more than one fourth the length of the head. If we can judge from the figure of the "*limanda*" in "*Yarrell's British Fishes*," (and the figures generally are exceedingly accurate,) its dorsal fin commences back of the eye; in the "*ferruginea*," it commences over the anterior third of the upper eye.

P. *dentata*. Mitchell. *The Flounder of New York.*
Trans. Lit. et Philosoph. Soc. N. Y. vol. i. p. 390.

This species, known by the fishermen as the "*Sand-dab*" in the Boston market, is frequently taken in the winter season in deep water at Provincetown; and although a marketable fish, is considered inferior to the "*plana*." In the stomach of this species I found a new "*Nucula*," which has as yet been detected only in this species, and which I described and figured in the second volume of this Journal. The largest individual I have seen of the "*dentata*," was twenty-one inches in length, eight and a half inches in width, and weighed three and a half pounds.

The eyes upon the right side of the body. All the right side of the body and the fins of a reddish brown color; the whole left side of the body and the fins perfectly white. Length of the *head* to the body, exclusive of the caudal fin, as 1 to 4; width of the *body* equal to half the length of the fish. *Mouth* very large; *upper jaw* slightly projecting beyond the lower; both jaws furnished with a single row of prominent, sharp teeth, separated from each other so that when the mouth is closed the teeth of one jaw shut into the space between those of the opposite jaw; the *lower jaw* has a blunt spine at the chin; *lips* small. *Eyes* placed over each other, separated by a bony ridge covered with scales similar to those over the whole head; *pupils* of the eye black; *irides* golden; longest diameter of the eye nearly equal to one third the length of the head. The *lateral line* makes a curve over the pectorals, so slight as to be scarcely observable.

The Dorsal fin commences just over the middle of the eyes, and terminates a short distance in front of the caudal rays.

The Pectorals are half the length of the head.

The Ventrals originate before the pectorals.

The Anal fin commences back of the middle of the pectorals, and terminates upon the same plane with the dorsal fin. The edges of the anal and dorsal fins on the right side fringed by the continuation of the whiteness of the left side upon them.

The fin rays are: D. 91; P. 11; V. 6; A. 70; C. 18.

HIPPOGLOSSUS. CUV.

Generic characters. *Both eyes and the color on the right side, and fins similar to those of the species of the genus Platessa; the jaws and the pharynx are armed with teeth that are sharper and stronger, and the form of the body is more elongated.*

H. *vulgaris*. Cuv. *The Halibut.*

Pennant's British Zoology, vol. iii. p. 198.
Mc Murtrie's Cuv. vol. ii. p. 250.
Strack's plates, No. 51. 1.
Trans. Lit. et Philosoph. Soc., N. Y. p. 386.
Yarrell's British Fishes, vol. ii. 23. et fig.

This well known and excellent fish is taken in shoal water in large quantities during the summer months; at other seasons, it inhabits deeper water. Great numbers are taken upon Nantucket shoals, frequently weighing 200 pounds each. An unusual number of this species was brought to Boston market in the early part of 1837, which were all sold at considerable profit. Eighty large schooners of from 60 to 80 tons burthen, belonging to Cape Ann, were thus employed. The flesh of this species is rather coarse and dry, but is much esteemed by many; the fins are considered quite a delicacy. *Fresh*, this fish brings a higher price than the cod; large quantities also are *smoked*; and occasionally, the *dried flesh* is eaten. Mr. Newcomb, senior, informs me that about 40 years since, a *halibut* was taken upon the south shore, and brought to Boston market, which, after the head and bowels were removed, weighed 420 pounds; this specimen when perfect, undoubtedly weighed as much as 500 weight. The largest individual of which I have any certain knowledge, Mr. Anthony Holbrook, a fishmonger in Quincy market, a man of unquestionable veracity, and whose knowledge of our fishes is equal to that of any of our fishermen, tells me was taken at New Ledge, sixty miles S. E. of Portland, Me., in 1807; it weighed upwards of 600 pounds. The voracity of this species is proverbial. Pennant cites two examples of ships' sounding leads having been swallowed by them; one of these individuals was afterwards captured.

The following description I have drawn up from a specimen 4 feet and 10 inches in length, weighing 78 pounds:

Body elongated; smooth, of a dark brown color on the right side; left side without spots. Length of the head to the length of the body as 1 to 4; lower jaw longer than the upper; *jaws* furnished with two rows of strong, sharp teeth; the inner row larger and incurved; lips large and fleshy. Pupils of the eye black; irides silvery; largest diameter of the eye, two and a half inches; shortest diameter, two inches; distance between the eyes, two inches. *Nostrils* double; anterior tubular, posterior larger.

The Dorsal fin commences above the anterior portion of the eye, and terminates a short distance in front of the caudal fin; height of this fin in its middle, to the height of the rays on a line opposite the base of the pectorals, as 6 to 1.

The Pectorals arise just back of the posterior angle of the operculum; length to height as 2½ to 7.

The Ventrals commence on a line opposite the base of the pectorals; the third ray is the longest.

The Anal fin arises from a line opposite the posterior portion of the pectorals, and terminates on the same plane with the dorsal. Two apertures anterior to the anal fin; the anterior, the anus; the posterior, the smaller, the urinary outlet.

The fin rays are: B. 7; D. 99; P. 17; V. 6; A. 73; C. 18.

Occasionally, reversed specimens of this fish are met with; during the last season, I saw in Boston market, a fish weighing 103 pounds, with the left side colored, bearing the eyes.

RHOMBUS. CUV.

Generic characters. *Color and eyes on the left side; teeth in the jaws and pharynx; dorsal fin commences anterior to the upper eye; dorsal and anal fins extending very nearly to the tail.*

R. *aquosus.* Mitchell. *The Watery Flounder.*

Trans. Lit. et Philosoph. Soc. vol. i, p. 389.
Boston Journal of Natural History, vol. i. p. 351.

This species, which has not been noticed in any numbers in our waters, until within the last three or four years, is known among the fishermen as the "*Turbot,*" and is sold by them as the "English Turbot." It is oftentimes taken in fishing for mackerel, quite near the shore. Although it generally weighs but a few pounds, specimens have been caught the last season weighing twenty pounds.

A specimen purchased in the market August 6, enables me to furnish the following description:

Length of the fish, eighteen inches; depth of the *body*, across the middle, exclusive of the fins, seven inches. Length of the *head*, three and a half inches; depth from the origin of the dorsal fin, three inches. *Body* elongated, with small scales, perfectly smooth. Left side of a reddish gray color, with large circular, oval or oblong blotches of a darker color, surrounded with a lighter margin, and also numerous white spots, which are more obvious upon the fins. Right side white, without spots. Upper eye slightly back of the under, in a vertical line. *Eyes* moderate in size, oblong; pupils blue black; irides silvery; distance between the eyes, equal to the longest diameter of the eye. Orbits, space in front of the eyes, and jaws, spotted with dull bluish spots. Gape of the *mouth* large; *jaws* equal in length, and armed with a single row of separated, quite large, sharp teeth; the front ones much the largest. A protuberance at the chin. *Nostrils*, three lines in front of the eyes. *Gill-covers* extend back of the eyes, nearly two and a half inches.

The *lateral line* makes a high arch over the pectorals, previous to assuming its straight course to the tail; the top of this arch, is more than one inch above the straight line.

The Dorsal fin arises over the anterior half of the orbit of the eyes, and extends to the fleshy portion of the tail; of a lighter color than the body of the fish; extremities of the rays free, and tipped with white; the first rays are the shortest; those at the middle and towards the posterior, longest; those at the extremity, of moderate height.

The Pectorals are light colored, transversely barred with dark colored bands, having a white blotch, at their inferior base; their length to their height as 1 to 3.

The Ventrals are very small, less than an inch high, of a light color, with darker spots; rays, deeply cleft.

The Anal fin arises just back of the ventrals, and terminates on a plane with the dorsal; similar in its form and color to the dorsal.

The Caudal fin is large and fleshy; the depth of the fleshy portion of the tail at the termination of the dorsal fin, one inch and a half; length of the caudal rays, two and a half inches; convex at the extremity; rounded when expanded.

The fin rays are as follows: D. 89; P. 12; V. 6; A. 68; C. 16.

The fish I have just described, is undoubtedly the "*Pleuronectes aquosus*," of Mitchell. No ichthyologist could mistake it for the "*Rhombus maximus*," "*Turbot.*" The "Turbot" is *nearly round*, and *its left side is nearly covered with numerous tubercles.* Like the turbot it is said to be often taken with the trawl-net, and like that species it is a *Rhombus*. In a paper upon our fishes published in the first volume of this Journal, I inadvertently remarked that, among other peculiarities, it differed from the *Turbot*, by the eyes of *that species* being on the *right side.*

In several points, this bears no slight resemblance to the "*Rhombus vulgaris*," "*Brill or Pearl*," but in the latter fish, the under jaw is the longer, and only a few of the first rays of the dorsal, extend beyond the connecting membrane.

ACHIRUS. Lacepede.

Generic characters. *Both eyes and color on the right side; the mouth distorted on the side opposite the eyes; small teeth in both jaws, but confined to the under side only, none on the same side as the eyes; form of the body oblong; dorsal and anal fins extend to the tail. No pectoral fins.*

A. *mollis*. Mitchell. *The New York Sole.*

The only specimen I have seen of this species was sent me by Dr. Yale, who writes me, it was taken Dec. 16, 1837, at Tashmou Pond, about a mile from the village of Holmes Hole. This pond is separated from the sea by a narrow beach, which is dry a portion of the year. It must be very rare at Holmes Hole, as Dr. Yale had never seen another specimen, although he had resided there years. The doctor remarks that, "it is said by common report to be very poisonous when eaten, but I do not *know* it to be such." Mitchell says, "it is delicate eating."

Entire length, six inches; length of the body, exclusive of the tail, four inches six lines; depth of the body two inches back of the snout, three inches exclusive of the dorsal and anal fins. Form, oval. *Eyes* on the right side. Color of the right side, dark brown, marked transversly with rather indistinct irregular black bands; left side white, with circular dark brown blotches, scattered over its entire surface, also in a less marked manner upon the fins. Length of the *head* nine lines; *eyes* small, nearly circular, protuberant, and placed directly over each other; *mouth* small, and without teeth; on the left side, the mouth is scarcely discernible. *Nostrils*, large. *Scales* on the body quite small. On the lower anterior portion of the operculum, and on the back, just above the eyes, the scales are larger, and longest, at the base of the first two inches of the dorsal fin on the right side of the body. The left side of the head is covered with soft tubercles, which are continued along an inch or more of the base of the dorsal fin. The *lateral line* commences just above the operculum, and is continued in a straight course to the base of the caudal rays.

The Dorsal fin commences at the very anterior extremity of the back, which projects slightly beyond the upper jaw, and is continued to the tail, but is not united with it.

There are no Pectoral fins.

The Ventrals are situated just in front of the anal fin.

The Anal commences in front of the posterior angle of the operculum, and terminates on the same plane with the dorsal.

The Caudal fin is one third longer than the width of the base. The rays of each fin are covered by scales; and those projecting backwards, present a very beautiful serrated appearance, more strongly marked on the right side of the body, the scales of the fins on the left side being colorless. The interstices between the fin rays, are black.

The fin rays are: D. 52; V. 4; A. 40; C. 16.

Although Mitchell's description is generally correct, and might have been copied, had I not determined to describe each species, so far as possible, from recent specimens, one point requires correction. He says, "it is soft and mucous, without a spine or prickle about him." Whoever will carefully examine this species, will observe, imbedded in the surrounding flesh, a strong compressed spine two thirds of a line in length, situated directly in front of the upper eye, and in a line with it, just back of the commencement of the dorsal fin, almost entirely concealed. This evidently escaped the notice of Mitchell, as in other respects he is clear and satisfactory.

I cannot speak so well of his *figure*, for the dorsal fin, instead of commencing in front of the eyes, is represented as taking its origin some distance back of them; the anal is figured as beginning too far back; and the base of the tail appears as if distorted.

FAMILY III.

DISCOBOLI.

CYCLOPTERUS,—subgenus. LUMPUS. Cuv.

Generic characters. ***Head and body deep, thick, and short; back with an elevated ridge, the investing skin enclosing simple rays; pectoral fins uniting under the throat, and with the ventrals forming a single disk.***

L. *vulgaris*. Cuv. ***The Lump sucker. Lump fish.***

Pennant's British Zoology, vol. iii. p. 117, et fig.
Strack's Plates, 11. 1.
Richardson's Fauna, iii. 260.
Trans. Lit. et Philosoph. Soc. vol. i, p. 480, et fig.
Mc Murtrie's Cuv. vol. ii. p. 254.
Yarrell's British Fishes, vol. ii, p. 270, et fig.

This not uncommon species in Massachusetts Bay is frequently seen after severe storms washed upon our beaches. Occasionally, it is taken in fishing for cod, with the hook; generally, however, it is found attached to sea-weed and other floating substances near the shore. Richardson tells us that "the Greenlanders eat its flesh either cooked or dried, and its skin raw, throwing away only the tubercles;" and Dr. Neal observes, "that it is purchased at Edinburgh for the table." With us, however, it is not used as an article of food. The common weight of this fish is from 3 to 4 pounds, and 6 to 12 pounds.

Mr. Jonathan Johnson of Nahant sent me a specimen from that place weighing 15 pounds, being two feet in length. And Mr. Covell, fishmonger in Quincy market, presented me with another, weighing 17 pounds. The whole appearance of this fish is very forbidding, being, in young specimens, a soft, gelatinous, tremulous mass; in older specimens, it is much firmer; but in both, is covered entirely with firm, horny spines. My description is taken from a specimen 17 inches in length.

Length of the specimen, exclusive of the tail, 14 inches; length of the *head*, 4½ inches; greatest depth, from the top of the ridge on the back to the abdomen, 8 inches. Color of all the upper part of the body, a bluish slate; beneath, yellowish. The whole surface of the fish is covered with an immense number of small stellated tubercles, studding even the rays of all the fins. Three rows of tubercles, much larger than those which are universally distributed over the fish, are observed projecting from either side. One row commencing at the upper anterior angle of the eye, curves slightly over the humeral bones, and then passes in nearly a straight line to the tail; a second row, composed of much larger, wider, more prominent tubercles, commences just beneath the posterior angle of the operculum, and terminates on the same plane with the extremity of the first row; the tubercles having diminished in size as they approached the tail, as in the first row; a third row, composed of a small number of still larger tubercles, commences on a line with the posterior portion of the ventral disk, and terminates just in front of the anal fin, forming the outer boundary of the abdomen. The two upper rows of tubercles are of the color of the back; the lower, colored like the abdomen; the tubercles of all these rows are granulated upon their sides, and have a naked spine at their summit. *Head* covered with tubercles similar to those of the body; those on the lower portion of the operculum larger than those on the other parts of the head; diameter of the eye one inch; irides red; distance between the eyes, two and a half inches. *Nostrils,* tubular. *Teeth* in the jaws sharp, and compactly placed; a greater number of rows of teeth in the upper, than in the lower jaw. Lips yellow. Just back of the top of the head, a compressed ridge rises abruptly, and as abruptly stops, after passing a short distance back; its depth being in its middle equal to one third of its length; and its length equal to one third the body of the fish; this ridge is formed of distinct rays, which are very visible in the dried specimen; the top of this ridge is covered with tubercles precisely similar to those which compose the middle row on the body; directly back of this dorsal ridge is a small flat surface composing the space between it and the dorsal fin, whose sides are armed with strong tubercles projecting laterally. Immediately behind this space, commences the dorsal fin.

The Dorsal fin is rather longer than high.

The longest rays of the Pectorals equal the width of the base of these fins.

The Ventrals, together with the anterior portion of the pectorals, form an oblong disk, of a bright yellow color, with six well marked lines on each side of its centre, by which it is enabled to attach itself very powerfully to foreign substances.

The Anal fin, commencing back of the beginning of the dorsal, terminates upon the same plane with it.

The Caudal fin, when not expanded, is a little longer than wide; when expanded, one fourth wider than long.

The fin rays are: D. 11; P. 20; A. 10; C. 12.

The young fish is blue above, and almost entirely white beneath.

ECHENEIS. Lin.

Generic characters. *Body elongated, covered with very small scales; a single dorsal fin placed opposite the anal; the head very flat, covered with an oval disk formed by numerous transverse cartilaginous plates, the edges of which are directed backward; the mouth wide, with numerous small recurved teeth on both jaws, the tongue, and the vomer.*

E. *naucrates.* Lin. *The Indian Remora.*

Sonnini's Buffon, vol. lxxii, p. 187.
Rees' Encyclopedia, vol. xiii.
Strack's plates, 45. 2. a poor figure.

I have seen a single specimen only of this species; it was taken by a fisherman from the bottom of his smack, to which it was attached in Boston Bay.

Length of the specimen, twenty inches; greatest depth, exclusive of the fins, two inches. *Body,* above, of a grayish slate color; lighter upon the sides, with a dark band, which, commencing at the tip of the lower jaw, as a small black point, runs along its margin to the angle of the jaw, then assuming a band which passes to the tail, interrupted only by the eyes; in front of the pectorals, this band is only two lines in width, at the pectorals it grows wider, is widest beneath them, and becomes gradually smaller as it approaches the posterior extremity of the fish. Top of the *head* flattened; back, between disk and dorsal fin, nearly circular; body, back of the dorsal, somewhat compressed. Length of the head, from the tip of the lower jaw to the posterior angle of the operculum, three inches, five lines; depth of the head, at the posterior portion, one and a half inches; width over the same portion, two inches, two lines. *Eyes* situated just half way between the tip of the lower jaw and the extremity of the operculum, circular, between three and four lines in diameter. *Nostrils*, double, small, furnished with fleshy appendages. Branchial aperture very large; membrane 5 rayed. The lower jaw, which terminates in a point, extends six lines in front of the upper; both *jaws* crowded with numerous small teeth, resembling very much those of a card. Teeth also in the throat, and upon the palatine bones. Tongue, rough. Upon the top of the head, is an adhesive disk, four inches two lines in length, one inch one line wide, at the anterior extremity; one inch six lines at the widest part of the posterior extremity; extending from the tip of the upper jaw to the middle of the pectorals; this disk has 21 transverse plates, divided by a longitudinal median fleshy line; these plates are light colored; the entire disk is margined by a fleshy border of the same color as the back, from 1 to 4 lines wide; the under portion of the margin, surrounded by a white line.

The Dorsal fin arises just in front of the middle of the body; it is of a dark slate color; the first ray is margined with white; this edging is continued up to and upon its tip, and the tip of the other rays, gradually diminishing in its width at about the tenth ray, and becomes at last scarcely discernible. This fin is seven inches long.

The Pectorals commence on a line with the posterior, four laminæ of the disk; the fins the color of the body; their length to their height as 1 to 3.

The Ventrals are just back of the pectorals; 5 rayed; their length, equal to one sixth their height.

The Anal fin arises on a plane with, and terminates upon the same plane as the dorsal; like it, it is dark colored and edged with white; its first rays, however, are higher than those of the dorsal. The anus is half an inch in front of the anal fin.

The Caudal fin is nearly even at its extremity; at its fleshy portion, anterior to the rays, it is four lines deep; at the commencement of the rays, one inch; at the extremity, when expanded, three inches. The upper and lower extremity of the tail, white.

The fin rays are: D. 29; P. 18; V. 5; A. 30; C. 18.

I think this must be the "*naucrates;*" it has but *twenty-one* plates; but slight variations may undoubtedly occur in this, as well as in the "*remora;*" in which, although it is described as having 18 plates, Yarrell's specimen had 17; and of two individuals from Cuba, lying before me, one has 18, and the other 19 plates.

E. *quatuordecimlaminatus*. Nobis. *The fourteen plated Remora.*

From the only specimen I have met with, which was kindly sent me by Dr. Yale, I am enabled to furnish the following description:

Entire length, five and a half inches. *Body* of a light reddish brown color, rather darker beneath. The *lateral line* commences at the origin of the pectorals, and making a slight curve over them to their extremities, is continued in a straight line to the tail. Length of the *head*, one inch three lines; *gill-covers* large; lower jaw two lines longer than the upper; *jaws* armed with strong, sharp, recurved teeth; teeth also in the pharynx, upon the palatine bones and the root of the tongue. Gape of the mouth moderate in size. *Eye*, one line in diameter. Top of the head entirely covered by an adhesive disk, which commences at the tip of the upper jaw, and extending on each side to the eyes, terminates on a plane with the posterior half of the pectorals, about three lines back of the posterior edge of the operculum. This disk is surrounded by a fleshy margin, which is tipped with a darker brown than the color of the body, and is divided in its middle by a longitudinal fleshy septum, on each side of which are *fourteen* distinct, strongly serrated laminæ.

The Dorsal fin commences about the middle of the length of the fish, nearly two inches long, two lines high. Its anterior portion rounded, gradually diminishing in height, as it approaches the tail.

The Pectorals are somewhat rounded at the extremities ; one inch two lines high ; three lines long.

The Ventrals are narrow, five lines long ; attached to the belly by a membrane extending from the inner ray.

The Anal fin commences a short distance back of the dorsal ; of a similar form with that fin.

The Caudal fin is nearly straight at its extremity ; three lines long, six lines high ; the distance between the extremities of the fin rays, is equal to their height.

The fin rays are : D. 32 ; P. 24 ; V. 4 ; A. 30 ; C. 18.

This species is *smaller* and *lighter colored* than the "*Remora*," and differs in the *number of its laminæ* in the disk. Without dwelling upon the less important distinctions, I conceive that the individual I have here described must be considered a new species.

ORDER IV.

MALACOPTERYGII APODES.

FAMILY I.
MURAENIDAE.

MURAENA. Lin.

Generic characters. *Body cylindrical, elongated, covered with a thick and smooth skin ; the scales very small ; lubricated with copious mucous secretion ; mouth with a row of teeth in each jaw, and a few on the anterior part of the vomer ; pectoral fins close to a small branchial aperture ; no ventral fins ; dorsal fin, anal fin, and caudal fin united.*

M. *Bostoniensis.* Le Sueur. *The common Eel of Massachusetts.*

Journal Academy Nat. Sciences, vol. i. p. 81.

This species which is the most common, or, I might say, the *only* eel brought to Boston market, is distinguished by its grayish brown color above ; and whitish, yellowish, or yellowish white color beneath, with a reddish tinge about the tail, which color also sometimes extends along the entire anal fin. Le Sueur, in the "*Journal of the Academy of Natural*

Sciences," observes, "that it is sometimes brought to market," alluding to the Boston market, "but is not much valued as an article of food." He must have visited our market at a season of the year, when the species is seldom taken, and collected his information from an inexperienced fishmonger. It is taken along our whole coast, as well as in the rivers and ponds of the State. At some seasons, spring and winter, for instance, great numbers are brought to market from the mouths of the neighboring rivers, upon the muddy bottoms of which they live, and meet with a ready sale; so great even, is sometimes the demand in winter, that it cannot be answered. At this season it is speared; holes having been cut through the ice for the purpose. The markets are usually supplied in spring from the rivers, where they are now taken in nets. At Medford, nets are stretched across the river, having in their middle a large bag capable of containing from fifteen to twenty bushels; as the eels are going up or down the river, they are thus caught, and are kept alive for the supply of the market in large ditches, excavated near the river, which are supplied by the tide with water. About 3000 pounds are yearly taken at Watertown. Those taken in summer when able to procure the "*Brit*," and other fishes upon which they feed, are much larger and richer, weighing from one to nine pounds.

M. *argentea*. Le Sueur. *The Silver Eel.*
Journal Academy Nat. Sciences, vol. i. p. 83.

From Dr. Yale I have received two specimens of a "Muraena," which answers in all important particulars to the "*argentea*." Its general color is silvery gray, darker upon its upper portion, with a clear satiny white abdomen. The spiracles are as long as the base of the pectorals. This species is taken in pots in October, when it leaves the ponds, and seldom at other times. At Holmes Hole, it is called "*Neshaw eel.*"

The following description of a specimen of each species, will show their different proportions. The specimens were each twenty-three inches in length:

M. *Bostoniensis*. From the tip of the snout to the base of the pectorals, eight inches; body back of the head, at the commencement of the pectorals, three inches and five lines in circumference; three inches and two lines around the *head*, at the distance of an inch and a half from the snout; circumference of the head in front of the eyes, one inch seven lines and a half; from the tip of the *lower jaw* to the anal fin, ten and a half inches; at the commencement of the dorsal fin, the circumference of the *body*, is three inches five lines; width of the body over the pectorals, one inch two lines; *pupil* of the eye black, iris golden; width between the eyes, four lines. *Lateral line*, indistinct.

M. *argentea*. From the tip of the snout to the base of the pectorals, seven and a half inches; body, back of the head, at the commencement of the pectorals, three and a half inches in circumference; three inches around the head, one and half inches from the snout; circumference of the *head* in front of the eyes, one inch four lines; from the tip of the *lower jaw* to the anal fin nine inches six lines; circumference of the *body* at the origin of the dorsal fin, three inches six lines; width of the body over the pectorals seven lines; width between the *eyes*, three lines. *Lateral line*, exceedingly distinct, appearing to divide equally the darker colored back from the beautiful lighter silvery abdomen. For the extent of six inches in front of the anal orifice, a well marked line or furrow resembling in appearance the lateral line.

FAMILY II.
ANGUILLIDAE.

AMMODYTES. Lin.

Generic characters. *Head and body elongated; gill-openings large; dorsal fin extending nearly the whole length of the back; anal fin of considerable length; dorsal and anal fins separated from the caudal fin.*

A. *tobianus*. Bloch. *The Sand Eel.*

Yarrell's British Fishes, vol. ii. p. 317, et fig.

Richardson in his "*Fauna Boreali-Americana*," observes, that as neither Pennant nor Mitchell has described the species of "Ammodytes" which they severally notice as being found in Newfoundland and New York, it is impossible to judge whether it was the "*tobianus*" or "*lancea*," or either of them. I trust the following description, drawn up from the largest of a number of specimens sent me from Holmes Hole by Dr. Yale, will serve to settle the point with some approach to accuracy.

Length of the specimen six and a half inches. Greatest depth, half an inch; greatest width, less than three lines. *Back* of a dirty yellowish brown color. Top of the *head* and upper part of the opercula, slate colored; this slate or silvery blue color passes down over the opercula in a broad band to the tail, giving the fish a beautifully brilliant appearance; beneath this, the sides and abdomen are silvery. The distance from the extremity of the snout to the end of the gill-covers, is to the whole length of the fish as 1 to 5. Depth of the *body* equal to one third the length of the head. *Lower jaw* projecting beyond the upper, and terminated by a conical tip. *Gill-covers* silvery; from the anterior inferior portion of the operculum, a few slight striæ pass obliquely upwards, backwards, and downwards to the posterior margin of the operculum. *Nostrils* double, and situated half way between the eyes and the snout. *Pupil* of the eye black; iris silvery; diameter of the *eye*, one line. *Lateral line* indented and straight.

The Dorsal fin commences two lines back of the posterior angle of the gill-covers, on a line with the end of the pectorals; this fin is situated in a groove throughout its whole length, and terminates two lines from the base of the caudal fin.

The Pectorals arise under the posterior angle of the gill-covers; in length they are one third less than the head. From the base of the pectorals, a slight membrane extends along the whole lower part of the abdomen on both sides, scarcely perceptible towards the tail.

The Anal fin is just one third the length of the whole body.

The Caudal fin is forked.

The fin rays are: D. 61; P. 13; A. 28; C. 14.

This species is evidently not the "*lancea.*" To mention no other character, the dorsal fin in the "*lancea*" commences on a line with the middle of the pectoral fin. Although the "*tobianus*" attains the length of several inches more than any of the specimens before me, and differs somewhat in the number of its fin rays, yet the general characters of the foreign species and our fish coincide so nearly, that I am led to believe them to be the same.

On several portions of the coast of Great Britain, these fishes are readily eaten by the poorer classes. But as more palatable species are easily obtained with us, they are allowed to collect on the shore in large quantities, to be devoured by their numerous enemies, among which the Cuttle fish prey upon them voraciously.

Since writing the above description, I have received a fine specimen, five and a half inches in length, from Nahant, which satisfies me perfectly as to this species being the "*tobianus.*" In this specimen the fin rays are as follows: D. 54; P. 13; A. 26; C. 17.

ORDER V.

LOPHOBRANCHII.

FAMILY I.

SYNGNATHIDAE.

SYNGNATHUS. Lin.

Generic characters. ***Body elongated, slender, covered with a series of indurated plates arranged in parallel lines; head long; both jaws produced, united, tubular; no ventral fins.***

S. *fuscus.* Nobis. *The brown Pipe Fish.*

I am strongly impressed with the belief that the fish noticed as the "S. *typhle*," by Mitchell, in his "*Fishes of New York*," is not that fish, but the same as the species before me, which I conceive to be a previously unnoticed species. I am indebted for my specimen to Mr. Jonathan Johnson of Nahant.

Body elongated, tapering exceedingly to the tail, covered with parallel horny plates, of an irregular dull brown color above; lighter beneath. Body, in front of the anal fin, heptangular, with three ridges on each side; above, in the middle, and below; and another in the middle of the abdomen terminating at the anus. Throughout the greater portion of the length of the dorsal fin, the body is hexangular. In front of the anus, are nineteen transverse plates; between the anus and the caudal rays, are forty plates. Length of the specimen six inches; the distance from the tip of the snout to the posterior angle of the operculum one eighth the length of the fish; the distance between the snout and the anterior angle of the eye, and that between the same angle and the origin of the pectorals, equal. *Jaws* tubular, compressed, a slight ridge above; *lower jaw* rather the longer, passing obliquely upward to form the mouth; top of the head depressed; a furrow between the eyes; a crest on the neck; *eyes* circular, half a line in diameter. *Operculum* brown above, golden beneath; under the glass, exhibiting minute granulations, and radiating striæ.

The Dorsal fin arises two inches two lines from the tip of the snout; the height of the fin one seventh of its length, of a light brown color.

The Pectorals just back of the operculum, the color of the under part of the body; length, one half of the height.

The Anal fin is situated under the middle of the dorsal fin, and is very minute.

The Caudal fin is two lines in length, darker colored than the body, rounded at the extremity.

The fin rays are: D. 38; P. 13; A. 3; C. 9.

Since the above description was drawn up, I have received a specimen also from Dr. Yale.

S. *Peckianus*. Nobis. *Peck's Pipe Fish.*
Plate I. Fig. 2.

The specimen here described was received from Dr. Yale, who thus writes me from Holmes Hole: "The small pipe fish was taken in a pond, south side of the Island, which communicates with the sea."

Its length is six inches. Its whole surface is covered with horny striated plates; the *body* gradually tapering from the head to the tail, at which part it is nearly a point. On each side of the anterior portion of the body, are three ridges, and one passes from the neck through the middle of the abdomen to the vent; this ridge upon the abdomen does not exist back of the vent. In front of the posterior extremity of the dorsal fin, the body is hexangular; back of this fin, quadrangular. Color of the specimen very similar to that of the preceding species. The divisions of the abdominal plates marked on their outer edges by lines of a darker color; these are very obvious upon the plates of the posterior portion of the body; much less distinct upon the plates in front of the dorsal fin. Length of the *head*, from the extremity of the snout to the posterior angle of the operculum, nearly six lines; a depression between the eyes; and a ridge upon the occiput, which is continued on to the neck. Operculum pectinated; or, appearing to the eye of a conchologist of the form of a Pinna; small at the anterior inferior portion; quite broad at the posterior, rounded beneath and behind, and covered with striæ radiating from its circumference; the upper part of the operculum of a dark brown color; beneath, white; its anterior portion marked by an oblique vitta passing backwards and downwards from the posterior inferior angle of the eye. *Jaws* tubular; upper portion fuliginous; beneath, white. Greatest depth of the jaws, equal to about one third the greatest depth of the head. ***Mouth*** opens obliquely; lower jaw slightly projecting; the depth of the anterior portion of the body at its middle, to the middle of the posterior portion, as 3 to 1.

The Dorsal fin commences at two-sixths the whole length of the fish, with the anal aperture beneath its middle; fin one line longer than the head; length of the last rays to the length of the fin, as 2 to 9; length of the rays rather less than the greatest depth of the body. Color of this fin a light brown, with black vertical bands.

No Anal fin can be perceived.

The only description I have met with, answering at all to the species before me, is that drawn up by Delaroche, in the 13th vol. of the "***Annales du Museum***," accompanied by a beautiful figure, under the name of "***Syngnathus Rondeletii***," among the fishes of Ivica. In his description he says, "La nageoire anale est tres petite, et on ne la découvre qu'en la recherchant attentivement." Cuvier, in the notes to his "***Regne Animal***" includes this species among those in which the ***anal is wanting***. Yarrell, in his "***British Fishes***," says "***the anal fin is minute***," and considers this species and the "***typhle***" synonymous. The "***Rondeletii***" differs in several prominent points from the fish I have above described. It has no ridge upon the head, which is flattened; the depth of its jaws are nearly equal to the depth of its head; its dorsal fin commences on a line opposite to the anus. In our species, a ridge exists upon the occiput; the depth of the jaws does not exceed in any portion one third the depth of the head; the anal aperture is opposite the middle of the dorsal fin.

Among the earliest cultivators of Ichthyology in our country, no name is more prominent than that of William Dandridge Peck. So early as the year 1794, while residing at the town of Kittery, in Maine, he wrote a clear and accurate "description of four remarkable fishes, taken near the Piscataqua, in New Hampshire." This paper was published in 1804, in the 2d part of the 2d volume of the "Memoirs of the American Academy of Arts and Sciences," accompanied with very good figures, when the early period of our country is considered. The manuscript of his Ichthyological Lectures also, afterwards delivered by him at Harvard University as Professor of Natural History, and kindly loaned me to examine by my friend, Thaddeus Wm. Harris, M. D., Librarian to the University, exhibits no inconsiderable degree of research. As the species described and first published by him as new, have, *three of them at least*, been described by other naturalists under other specific names, I feel that I am performing an appropriate duty, in connecting the name of our deceased countryman, whose merits have been unjustifiably overlooked, with one of a class of animals, whose history he so successfully endeavored to elucidate.

June 25th, 1839. By the kindness of my friend Samuel Cabot, Jr., I have received a living male specimen of this species. It was taken at the swimming school in this city; and soon after its capture, numerous ova contained in its false pouches were hatched; so that when I came in possession of it, two days after it was caught, it was surrounded by one hundred and fifty young, about half an inch long, nearly colorless, with several narrow transverse black bands. From this specimen I am enabled to give the natural appearances more correctly than could be done from a preserved fish. This specimen is 7 1-2 inches in length; its general color is an olive brown with transverse darker colored blotches or bars, thirteen of which are seen in front of the dorsal fin. The posterior portion of the *body* is darker colored than the anterior. The under surface of the body anterior to the vent, is of a beautiful golden yellow; the portion back of the vent, for about two inches, is nearly white; this portion is much wider than the rest of the body, and presents two membranous flaps, which approach each other at the median line, thus forming pouches, or a false belly, in which are contained the ova of the female; the under surface of the posterior portion of the body, of the same color as the upper. The upper portion of the operculum olive colored; the lower portion, golden yellow. Color of the snout brown, having a darker line running through its centre from the eye to the mouth. The *eyes* are prominent and very moveable in their orbits; the pupils black; the irides golden.

The Dorsal fin has 45 rays.

The Pectorals are lighter colored than the body.

The Caudal fin is black, and rounded at its extremity.

The motions of this species, which is the only "Syngnathus" I have seen alive, are exceedingly rapid, resembling the gyrations of the "Colubers."

At the moment these pages are printed, I am enabled to examine several living specimens, all of which have been taken at the same locality with that last referred to. They have each, either their pouches crowded with ova, or are in the act of protruding the young. And the accurate eye of my friend Dr. Wyman has detected, and he has pointed out to me, an exceedingly minute anal fin, which is scarcely discernible without the aid of a glass.

HIPPOCAMPUS. CUV.

Generic characters. *The jaws united and tubular, like those of the Syngnathi; mouth placed at the end; body compressed, short, and deep; the whole length of the body and tail divided by longitudinal and transverse ridges, with tubercular points at the angles of intersection; both sexes have pectoral and dorsal fins; females only have an anal fin; neither sex has ventral or caudal fins.*

H. *brevirostris*. Cuv. *The short-nosed Sea-horse.*

Trans. Lit. et Philosoph. Soc. N. Y. vol. i. p. 475.
Yarrell's British Fishes, vol. ii. p. 342, et fig.

A single line is devoted to the description of this species by Mitchell in his "*Fishes of New York.*" The only native specimen I have seen, was received in a dried state from my friend Dr. Yale, who found it on the shore at Holmes Hole. He says he "never knew one to be taken alive, yet they are frequently found on the shore." From this female specimen, I have drawn up the following description:

Color, yellowish brown; entire length five inches. Length of the *head,* one inch; *snout,* three lines long; diameter of the *eye,* half a line. Operculum covered with striæ radiating from the anterior part; a short spine, at the base of the snout in front of the eye; directly above each eye, a larger spine; at the posterior angle of the eye, a very short spine; beneath the eye, on the neck, two small spines. *Body* heptangular; on each side, three rows of prominent spines; on the under side, a single row. Tail quadrangular, gradually tapering towards the extremity. The body is divided into eleven segments, bounded by horny projections; greatest width of the body, seven lines. At the origin of the tail, the body presents a slight projection, for the length of three segments, upon which is situated the dorsal fin. Tail divided into thirty-six segments; at the base, two lines in width; at the extremity a mere point.

The Dorsal fin has twenty rays.

The Pectorals, directly back of the operculum, contain fourteen rays.

The Anal fin with about four rays; the exact number difficult to be ascertained, on account of the dry state of the specimen.

This specimen is a *female*, as is proved by its having an anal fin, which Yarrell says is not found in the male; and from the size of the trunk.

ORDER VI.

PLECTOGNATHI.

FAMILY I.
GYMNODONTES.

TETRAODON. Lin.

Generic characters. *Both jaws divided in the middle by a suture, producing the appearance of four teeth in front, two above and two below. The skin over part of the body, armed with numerous short spines. The branchial orifice small.*

T. *turgidus*. Mitchell. *The Swell Fish. Puffer.*
Trans. Lit. et Philosoph. Soc. N. Y. vol. i. p. 473, et fig.

This very curious fish, which receives its name from its power of inflating itself to a surprising dedegree with air, was first described by Mitchell. His description of the fish itself is rather indefinite, and his figure is not scientifically accurate. He says: "Length about 12 or 14 inches; depth less than two inches, and breadth about two inches; but the belly is loose and flabby; and it may be distended to a large size, apparently at the will of the fish."

"With yellowish variegated back, white, rough belly, and a remarkable propensity to distend the abdominal sac with air, when he is out of water." The figure accompanying this description represents the species as having the back rough from just back of the eyes to the caudal fin; and the space between the eyes and the extremity of the snout, smooth. Of the two specimens I have had an opportunity of examining, one was eight inches in length; the other, nine inches. The former was taken in Boston harbor. From the latter, sent me by Dr. Yale, from Holmes Hole, I would offer the following description:

All the upper part of the body yellowish white, with an immense number of minute black dots. Abdomen white. Several undefined black blotches on the back, which, as they approach the belly, assume the appearance of bars, six to eight of which are noticeable,—two in front of the pectorals, and the last at the base of the caudal fin; these bars vary, in their extent upon the abdomen, from two to five lines. The whole surface of the body, save the space between the dorsal and caudal fins, and the anal and caudal fins, roughened by innumerable small spines. Length of the fish, nine inches. Greatest depth, two inches. Width across the back, over the pectorals, two and a half inches. Distance from the snout to the anterior angle of the eye, one inch and two lines; distance between the eyes half an inch. Greatest circumference of the specimen, when inflated, thirteen and a half inches.

The fin rays are: D. 6; P. 15; A. 6; C. 7.

Dr. Yale informs me that this fish is frequently taken when fishing for other species.

ORTHAGORISCUS. Schn.

Generic characters. *Jaws undivided, forming a cutting edge; body compressed, deep for its length, short, truncated, without spines; tail short, and very high vertically; rays of the dorsal and anal fins long and pointed, both united to the caudal fin at the base.*

O. *mola.* Lin. *The short Sun Fish.*

Plate III. Fig. 1.

Turton's Linnæus, vol. i. p. 891.
Shaw's Zoology, vol. v. pt. 2d, p. 438 et fig.
Pennant's British Zoology, vol. iii p. 115, fig. 54.
Trans. Lit. et Philosoph. Soc. N. Y. p. 471.
Strack's plates, No. 13. 4.
Mc Murtrie's Cuv. vol. ii. p. 272.
Yarrell's British Fishes, vol. ii. p. 350 et fig.

This is not a common fish in Massachusetts Bay. Occasionally, two or three years pass in succession without a single specimen being met with; at others, several may be taken. Its motions are very sluggish, and it swims near the surface of the ocean. On account of the great elasticity of its flesh, it is captured with great difficulty; it is generally gaffed at or near the branchial aperture. Its flesh is sometimes used for balls. Its *liver* is very oily, furnishing two or more quarts of oil, which is used by the fishermen to grease their masts with; and is also by many of them considered a valuable application in cases of sprains and bruises. To the kind attentions of Capt. Blanchard, I am indebted for a fine male specimen of this species, which he harpooned in Boston Bay, early in July. It presents the following appearances:

The body is oval; its whole surface a fine, unyielding, granulated cuticle, covered with a thick adhesive mucus; back, dark gray. Abdomen nearly white; the right side of the body rather darker than the left; both sides of a dirty white color, with silvery reflections. Length 54 inches; depth across, from the middle of the pectorals, two and a half feet; from the top of the dorsal to the extremity of the anal fin, six and a half feet. Weight about 200 pounds. Length of the head, from the tip of the snout to the base of the pectoral fin, 17 inches; flattened over the snout, which is obtuse, and projecting about an inch in front of the upper jaw. *Eyes* rather large, convex, very moveable in their orbits; pupils black; irides a dark brown, encircled within by a silvery ring; larger diameter of the eyes, 2½ inches; smaller diameter, 2 inches. *Nostrils* double, just in front of the eyes. *Mouth* small. *Jaws* armed with a broad bony plate, sharp at the edges. Upon the top of the head, an arched ridge commences on a line with the anterior angle of the eyes, and is continued to a line above the origin of the pectorals, then a straight line is continued to the dorsal fin. The sides of the head project out from the body quite prominently over the eyes to the branchial aperture. Operculum directly in front of the pectorals, three inches in its greatest diameter.

The Dorsal and Anal fins are triangular, situated at the upper and lower posterior extremity of the fish. Length of the dorsal, 13 inches; length of the anal, 12 inches. Height of the dorsal, 21 inches; height of the anal, 21 inches.

The Caudal fin borders the extremity of the body, being connected with both the dorsal and anal fins; its general color is similar to that of the inferior portion of the sides; its outer edge is flesh colored. It is scalloped or divided into digitations, about 8 in number, of which the upper are smaller, and the sixth the largest. A broad, nearly black band commences at the origin of the dorsal fin, and, running along its base, is continued in front of the caudal and anal fins to the anus; this band is lighter colored along the base of the anal, and here it is also narrower, being about the same depth as at the dorsal; but along the base of the caudal it is considerably deeper, even equal to the least height of this fin.

The Pectorals are in height 7 inches; length 4 inches; greatest width 6½ inches.

The anus is large and corrugated, situated two inches in front of the anal fin. Directly in front of the anus commences a very obvious carina, which is continued until opposite the origin of the pectorals. The very dense texture of the fins renders it almost impossible to determine with accuracy the number of their rays. As nearly as I have been able to distinguish them, they are as follows:

D. 13; P. 13; A. 15; C. 9.

Upon the exterior of this species, were attached several parasites; at the base of, or near to, the fins, a large number of the "*Pennella sagitta*" were found embedded, with their pinnated extremities projecting like tentaculæ; and to them, were firmly fixed specimens of the "*Cineras vittata.*" One beautiful specimen of the "*Tristoma coccineum,*" very accurately figured by Yarrell, as being taken from this species, was found firmly attached to the posterior extremity of the fish. Closely attached to the branchiæ were a dozen or more specimens of the "*Cecrops Latreillii.*" The thickness of the skin, where cut into, varied from 2 to 3 inches. The *stomach* and bowels contained no injesta; but their inner coat was lined with a large quantity of very viscid mucus, in which was observed a large number of "*taeniæ.*" The *muscular coat of the intestines*, exceedingly thick; intestines 14 feet in length. The *liver* was of a bright yellow color, weighing about 8 or 10 pounds, and exceedingly oily. Numbers of "*Cysticerci*" were imbedded in its substance. The edges of the branchiæ, and also their membrane, as well as the inner membrane of the operculum, were roughened like the cuticle.

A second specimen having been taken and carried into Nahant, during the last season, my friend Dr. Wyman visited it at my request, and besides furnishing the following notes, has very kindly enriched my account of this species, by the accompanying drawing:

"Length, 54 inches; diameter of the operculum, 3 inches; of the eye, 2 inches; greatest breadth of the fish, 30 inches; pectoral fins, 8 inches high, 6 long, composed of 10 rays; anal fin, 18 inches high, 10 long, composed of 18 rays; 9 scallops to the tail, 6 inches in their broadest part."

I am aware that the ichthyologist will think that the above description does not much coincide with Yarrell's account of the "*mola.*" Still less does my figure agree with his; it will be remembered, however, that his plate was taken from a "preserved specimen," only fourteen inches long; and that his description is drawn up from the same specimen. From Pennant's description, I should judge he had never seen the fish. The description in "Turton's Linnæus" agrees pretty well with my specimen in all its important points. It will also be observed that Yarrell remarks, that "there is reason to believe this fish alters in appearance as it increases in age. In a much larger example, the skin was of an uniform dirty pale brown; the texture hard, rough, coarse and thick."

FAMILY II.

SCLERODERMI.

MONOCANTHUS. CUV.

Generic characters. *Very small scales, covered with stiff and thickly set asperities, like the pile on velvet; extremity of the pelvis salient and spinous as in the true Balistes; a single large serrated spine in the first dorsal, or at least the second one is almost imperceptible.*

M. *Massachusettensis.* Nobis. *The Massachusetts File Fish.*

The only specimen I have seen was sent me by Dr. Yale, as having been found in Massachusetts Bay.

Its entire length is four inches; depth across, from the base of the dorsal spine, two inches; depth at the base of the tail, three lines. *Body* oblong, very much compressed; surface granulated, and exhibiting numerous minute white cilia suspended from its sides. Color, a yellowish brown, variegated over its entire extent with brownish markings and blotches, which are less obvious beneath. Length of the *head*, one inch; *jaws* of equal length; *teeth* stout. *Eyes* circular, one fourth of an inch in diameter; above, and just back of the eye, a strong, granulated, curved spine, half an inch long, is situated, with small sharp spines upon its posterior lateral edges, pointing downwards and backwards.

The Dorsal fin commences three quarters of an inch back of the spine; composed of colorless rays, roughened at their bases. The pectorals also, are colorless, and rounded when expanded.

The Pelvic bone projects, is quite moveable, and is connected by a dewlap to the abdomen.

The Anal fin is situated just back of the dorsal; the base of its rays are granulated like those of the dorsal; and it is of the same form as that fin.

The Caudal fin is darker colored than the other fins.

The fin rays are: D. 34; P. 12; A. 34; C. 12.

ALUTERES. CUV.

Generic characters. ***An elongated body covered with small, and scarcely visible granules; a single spine is the first dorsal; the chief character is in the pelvis, which is completely hidden under the skin, and is without that spinous projection observed in the other Balistes.***

A. *monoceros?* Bloch. *The Unicorn File Fish.*

Shaw's Zoology, vol. v. pt. ii. p. 399, et fig.

To Dr. Yale I am indebted for the specimen before me; I have met with no other individual of this species.

Length, three inches; depth across, from the base of the dorsal spine, half an inch; depth at the base of the tail, one line. Color, a light brown, mottled by a darker brown, which is deepest above; neck, silvery. Surface of the fish, almost smooth to the touch; but presenting a granulated appearance under the glass. Length of the *head*, half an inch, gradually arching from the tip of the snout to the spine; *lower jaw* slightly projecting; *teeth* moderate in size. *Eye* circular; diameter of the eye, less than a line. Just over the posterior margin of the orbit of the eye, a slender, roughened spine, one fourth of an inch high.

The Dorsal fin arises half an inch back of the spine; composed of delicate, transparent, colorless rays.

The Pectorals arise on a line with the dorsal spine.

The Anal fin formed like the dorsal, arises on a line with, and terminates just back of that fin.

The Caudal fin, is dark brown ; the upper and lower rays the shortest ; the middle are the longest ; and to the former, in length, as 6 to 1.

The fin rays are : D. 34 ; P. 10 ; A. 34 ; C. 12.

OSTRACION. Lin.

Generic characters. *Head and body covered with regular bony plates soldered in such a manner as to form a sort of inflexible shield, which invests them so that the only moveable parts are the tail, fins, mouth, and a sort of small lip with which the edge of their gills is furnished, all passing through holes in this coat of mail. Jaws armed with ten or twelve conical teeth. A single dorsal and ventral fin.*

O. *Yalei*. Nobis. *Yale's Trunk Fish*.

Journal of the Boston Soc of Nat. Hist. vol. i. p. 353, et fig.

The only specimen which has been found of this species upon our coast, was discovered alive by Dr. Yale in 1833, among the sea-weed on the beach at Martha's Vineyard, and presented by him to the Boston Society of Natural History. In 1836, I read a description of this fish to the Society abovementioned, associating with it the name of the gentleman by whom it was discovered, as a deserved respect due him by the Society, for his frequent donations to their cabinet, and his zeal for natural science.

My sense of personal obligation to him may, in some slight measure be conceived of from the numerous references made to his kind attentions throughout the pages of this Report.

The description from the "*Society's Journal*," I extract as follows:

"*Body* triangular; all the upper portion, of a light lurid appearance, covered with hexagonal plates, each containing six raised lines; two subcaudal spines, short and somewhat incurved; back of the dorsal fin, a large isolated plate three quarters of an inch in length, composed of portions of the several plates, separated from the rest of the horny cuticle by a continuation of the ligamentary substance in which is imbedded the fin. Form of the *body*, very similar to the "*bicaudalis*;" the entire surface, as far back as the dorsal and ventral fins, is covered with hexagonal divisions or plates; these are very large back of the eyes and ventral fins, and include an immense number of small granulations, which are subdivided by six elevated lines of similar tubercles; in front of the eyes and pectoral fins, these plates are smaller and less distinct; the body beneath, white and covered with similar scales; from the angle of the eye to the ligamentary substance at the base of the tail, are included ten plates in a direct line; from the highest point of the back to the belly, nine similar rows of plates; behind the dorsal fin is a surface of ligamentary substance, three inches in length, of a darker color than the rest of the surface, extending to the caudal fin, and containing, just back of the dorsal fin, one isolated plate. Subcaudal spines short, stout, smooth, and a little incurved. *Mouth* large, prominent, armed with large, strong teeth; *eyes* large, and distant an inch and a half from the mouth; *nostrils*, less than a quarter of an inch in front of the eyes.

The fin rays are: D. 10; P. 12; A. 10; C. 10.

The length of this specimen, in its present dried state, is fourteen inches. From the contracted and wrinkled appearance of the ligamentary portion at the base of the tail, it must vary considerably from the size of the living fish.

From observing the plates alone of the "*bicaudalis*," this might be mistaken by a careless observer for that species; but a careful examination of both the figures and the descriptions, shows them to be distinct.

The number of the fin rays of the two species do not vary; but the comparatively plane and immaculate surface of the one, corresponds but little with the very elevated striæ and numerous spots which cover the exterior of the other.

CHONDROPTERYGII.

ORDER I.

CHONDROPTERYGII BRANCHIIS LIBERIS.

FAMILY.

STURIONIDÆ.

ACIPENSER. Lin.

Generic characters. *Body elongated and angular, defended by indurated plates and spines, arranged in longitudinal rows; snout pointed, conical; mouth, placed on the under surface of the head, tubular, and without teeth.*

A. *oxyrinchus.* Mitchell. *The Sharp-nosed Sturgeon.*

Trans. Lit et Philosoph. Soc. N. Y. vol. i. p. 462.
Trans. of Amer. Philos. Soc. new series, vol. i. p. 394.

In May 1838, I received of Mr. Freeman, fishmonger in Quincy market, a specimen of a *sturgeon,* which I suppose to be the "*oxyrinchus,*" Mitchell; afterwards more minutely described by Le Sueur. This fish was taken in Charles river at Watertown, and measured 2 feet and 3 inches in length. All the upper part of the *body*, of a grayish brown color; inferior portion of the sides, silvery; beneath, white. Whole upper portion of the *head*, bony; irregularly marked upon its surface; five longitudinal rows of flattened plates, of the same structure as the covering of the head, but of a lighter color. The largest plates form the dorsal ridge; they are compressed at their sides, and terminate above, in strong sharp spines, which are turned backwards; radiated lines are indistinctly seen running from the centre of these scales to their circumference; this row is composed of twelve plates; the first are the largest; that at the commencement of the dorsal fin, by far the smallest; between the dorsal and caudal fins, are situated 4 plates; two quite small, just back of the dorsal, forming a pair; next to these, a much larger one; and lastly, an elongated one at the commencement of the caudal fin. A second row of scales commences just back of the operculum, situated where the lateral line is usually observed, and is continued to the base of the tail; these plates, 28 in number, are placed obliquely; they are narrowed to a point at their extremities, widened in their centres, and like the former are crowned by a spine, from the base of which radii diverge; the plates at the posterior extremity of the body, much the smaller. Beneath this row commences just back of the ventrals a third row of plates, larger than those of the last row, eight in number, placed vertically.

The whole surface of the body not occupied by the plates, granulated throughout. *Head* flattened above, slightly depressed between the eyes; the back part of the head terminates in a pointed plate. *Snout*, blunted. *Eyes*, small; pupils, black; irides, yellow; diameter of the eye, equal to one fifth the distance between the eyes. *Nostrils* double, situated directly in front of the eyes, the inferior much the larger. The operculum consists of a single large plate with rays diverging from its centre. *Mouth* without teeth, situated on the under surface of the head, half as wide as long, capable of great protrusion; half way between the mouth and the extremity of the snout, are situated four cirrhi placed on a line across, nearly as long as the mouth.

The Dorsal fin is situated at the posterior extremity of the body; the first rays are higher than the length of the fin.

The Pectorals arise from a strong, triangular plate; the first ray is very large and strong; the seventh and eighth rays the longest; width of the fins at their base, less than half of their length.

The Ventrals are placed far back, width at their base, equal to two thirds of their height.

The length of the Anal fin is equal to half of its height; the last rays equal in height to one third the height of the longest rays.

The Caudal fin is forked; its upper lobe nearly double the length of the lower; the membranous structure of this fin renders it extremely difficult to count the number of its rays with accuracy.

The specimen I have described is evidently a young fish. My friend, Thomas A. Greene, Esq. of New Bedford, writes me from that place under date of May 20th, 1838: "On visiting the market a few mornings since, I saw two huge sturgeons more than six feet long; they were taken in a seine the day before."

I learn from the fishermen that sturgeons are sometimes taken in our Bay, eight or ten feet in length, weighing as much as 300 pounds, and that their flesh is eaten by them, and considered very palatable. Mitchell says, it "grows seldom to a greater length than five feet;" while Le Sueur observes that the largest specimen he had seen, was between three and four feet long.

ORDER II.

CHONDROPTERYGII BRANCHIIS FIXIS.

FAMILY I.

SELACHII.

CARCHARIAS. Cuv.

Generic characters. *Jaws and head depressed; nostrils pierced in front; teeth pointed and cutting, often serrated at the edges; first dorsal fin large and placed behind the pectorals and before the ventrals; pectoral fins large.*

C. *vulpes*. Lin. *The Fox Shark. Thresher.*

Turton's Linnæus, vol. i. p. 918.
Pennant's British Zoology, vol. iii. p. 97 et fig.
Trans. Lit. et Philosoph. Soc. N. Y. vol. i. p. 482.
Mc Murtrie's Cuv. vol. ii. p. 285.
Yarrell's British Fishes, vol. ii. p. 379 et fig.

This species, which sometimes weighs 200 pounds, is called by the fishermen "*Thresher*," and "*Swingle tail*," from the motions of its tail, which is often used with great force in defence. It is met with in our waters in summer, not often however, pursuing *mackerel* and *menhaden*, upon which it feeds. Generally it is taken in nets with other fish: when taken with the hook, it is secured with much difficulty on account of the constant and powerful threshing of its tail.

On the 28th of July, 1838, I was fortunate enough to see a very fine male* specimen of this shark, which was taken in the vicinity of Nahant the previous day, which enables me to furnish the following description: Total length, twelve feet; circumference of the body, at the origin of the dorsal fin, four feet; length of the tail, from its origin to its extremity, five feet six inches; the distance from the tip of the snout to the origin of the dorsal fin, measuring over the curve of the back, two feet and a half; depth of the body, back of the first dorsal, about fifteen inches. Color of all the upper part of the body, together with the fins, a dark bluish lead; beneath, white, with light bluish blotches upon the outer edges of the abdomen. Surface of the skin smooth if the hand is passed towards the tail; rough, if it be reversed.

Length of the *head* thirteen inches from the tip of the snout to the first branchial aperture. Occiput slightly convex, an arch upon the back, opposite the branchial apertures. *Eyes* situated vertically, very moveable in their sockets, their longest diameter one and three quarter inches; pupils blue black, being a longitudinal fissure, edged with golden. *Snout* blunted, five inches from the mouth to its tip. Gape of the *mouth* six inches in extent, three rows of teeth in each jaw, smooth on their edges, widely separated from each other; the first two rows nearly perpendicular, back row recurved; teeth in the upper jaw, the larger; in the lower jaw, straighter. Five branchial apertures placed vertically; the first, smallest, just before the pectorals.

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* Both Pennant's and Yarrell's plates are evidently taken from female specimens.

The first Dorsal fin is triangular, eleven and a quarter inches long, twelve and a quarter inches high.

The second Dorsal is eight inches in front of the tail, and twenty inches from the first dorsal; three and a half inches long; three quarters of an inch wide.

The Pectorals are twenty inches high, eleven inches long, falciform; at the posterior extremity of the fin is a small digitation.

The Ventrals are five and a half inches back of the dorsal fin; eleven inches long; nine inches high. Anus large, between the ventrals. The claspers are sixteen and a half inches long from the anus; depth at their base, one and a quarter inch.

The Anal fin is situated about four inches in front of the tail, four inches long, one inch high.

The Caudal fin is composed of two lobes; the lower lobe is seven inches long, nine high; the upper, falciform, its greatest depth eleven inches, six and a half inches in its middle, two and a half inches at the extremity; greatest depth across both lobes, sixteen and a half inches.

The body of the fish is terminated on the back, by a semicircular ridge; a depression of two and three quarter inches in extent, is seen just back of this, between it, and the tail, at the origin of which is quite a concavity. At the termination of this depression, the caudal fin commences, exhibiting at its origin, a very abrupt prominence.

The ichthyologist will observe that I have made no mention of a triangular process which is found upon the inferior portions of the upper lobe of the tail, within a few inches of its extremity; the tip of the tail of my specimen had been removed, probably in some encounter; its upper edge had healed over, but a portion of a denuded vertebra was left exposed, and the lower edge of the wound was not healed. So that the tail was probably several inches longer previous to the injury.

In the ninth volume of the "*Medical Repository*," published in New York in 1805, is a very imperfect description, together with a rude figure of this species taken near Long Island. Dr. Mitchell, when he wrote that description, supposed it to be a new species. He was afterward satisfied however that it was not a new fish, as we may fairly infer, by his extracting a portion of this description, into his paper upon the "Fishes of New York," and placing it under the head of "*Squalus vulpes*," without making any reference to his former remark "that it is evidently a different species from that figured and noticed by Pennant in his British Zoology."

C. *obscurus.* Le Sueur. *The dusky Shark.*

Journal Academy Nat. Sciences, vol. i. p. 223, et fig.

In a paper by Le Sueur upon "Several new species of North American Fishes," in the first volume of the "Journal of the Academy of Natural Sciences," a fish is described under the name of "*Sqaulus obscurus*," which I have little doubt he found in the waters of our state. Be that as it may, although he does not mention its locality, he furnishes us with a good figure of the species, and also of the upper and lower teeth. The only two species of shark with which this could be confounded upon our coast, even by a careless observer, are the "*Carcharias vulpes*"—*Fox Shark*, and "*Lamna punctata*"—*Mackerel Shark;* in both these species, the edges of the teeth are smooth. In the "*obscurus*" however, they are deeply serrated. In the winter of 1837, my brother-in-law, Thomas M. Brewer, M. D., brought me a triangular serrate tooth, he took from the jaw of a shark which had been cast ashore at Nahant; and in the summer of 1838, my friend Samuel Cabot, jr., sent me a dozen teeth which he procured from another shark at Nahant, evidently of the same species with the preceding. Inasmuch then, as these teeth are triangular and serrated, and the description of the specimens seen by these gentlemen, answers to the plate of Le Sueur, I feel authorized in admitting this species here. The following is Le Sueur's description:

"Tail with a carina undulated above, and slightly emarginated at the base; pectorals long, narrow, and falciform; dorsals and anals projecting backwards in a point; second dorsal opposite to the anal, the latter bilobed. A white spot on each side of the neck. *Head* flat and broad; snout sharp edged, rounded and wide at the end; *eyes* lateral, large, orbicular, pupil transverse; narrow, with a nictitant membrane originating below; *branchial* apertures five, unequal, the first very large, the last very small, and situate above the origin of the pectoral fins; *nostrils* oblique and partially covered by a short, pointed appendage on the margin, near the end of the snout; *tail* rounded, strong, with a falciform fin, terminating in a distinct, triangular, lanceolate lobe; lower lobe of the fin short and rounded; *ventrals* small subquadrangular, without posterior process; *teeth* triangular, serrate."

LAMNA. Cuv.

Generic characters. *Point of the nose conical, nostrils pierced on its under surface; all the five branchial apertures in advance of the origin of the pectorals; the first dorsal fin placed much nearer the line of the pectoral than the anal fin; lobes of the tail nearly equal.*

L. *punctata.* Mitchell. *The mackerel Shark.*

Plate III. Fig. 2.

Trans. Lit. et Philosoph. Soc. N. Y. vol. i. p. 483.

In the summer, this is quite a common species in our waters. The fishermen, while fishing for mackerel and cod, are frequently much annoyed by having their hooks and lines bitten off by this intruder. It occasionally attains the length of eight or nine feet, and weighs between 300 and 400 pounds. No portion of it is used save the *liver;* this organ, however, furnishes a *valuable oil.* Seven gallons of oil are not unfrequently extracted from the liver of a single fish. And although it is generally used only by the *curriers*, yet, when carefully prepared by boiling the *fresh liver*, it is as good as *whale oil* to burn. As this species is generally seen following shoals of mackerel, upon which it feeds, it is commonly known among the fishermen as the *Mackerel Shark.*

By the politeness of Messrs. McLoud and Dill, fishmongers, I was enabled to examine a fine specimen of this species, eight feet in length, taken the latter part of July, 1838, in a net at Marshfield; from this specimen, I drew up the following account:

All the upper part of the body, greenish; lighter upon the sides; white, beneath. *Head*, small; snout blunted at its tip. *Eyes* circular, very moveable in their orbit; pupils black; irides dusky; diameter of the eye, two inches; distance between the eyes, five inches. *Nostrils* large, situated vertically under the snout. On a line above the eyes, a series of mucous pores resembling black orifices, are seen running towards the snout; another series, between the eyes, (on a line with them,) and the snout. Upon the whole under portion of the snout, these are also distributed. Three rows of small, sharp, triangular *teeth*, smooth at their edges, in each jaw, the two first straight; the back row, recurved; the three teeth on each side of the middle of the lower jaw, the largest. *Tongue* large, rough, fleshy. Five large branchial apertures, situated vertically; the distance between the first, greater than between the posterior. Depth of the fish in front of the dorsal fin, fifteen inches; distance from the extremity of the snout to the dorsal fin, thirty-four inches.

The first Dorsal fin is triangular, with a fleshy horizontal process pointing backward from its base posteriorly; one foot one inch long; one foot high; between this and the second dorsal, twenty-three inches.

The second Dorsal is adipose, rhomboidal, four inches long, two inches high.

The Pectorals are quite strong, and somewhat lunated, ten inches long, eighteen inches high; seven inches from the first branchial aperture.

Length of the Ventrals, eight and a half inches; height, four inches. Distance between the pectorals and the ventrals, twenty inches. Anus large between the ventrals. Eight inches between the extremity of the ventrals and the origin of the anal fin.

Length of the Anal fin, four inches; height two inches. On a line with the origin of the second dorsal, a wide carina runs on each side to the tail. The space between the second dorsal and the tail, four inches wide in its middle; at the posterior portion of this space, a crescent-shaped ridge, three inches across; distance from this to the middle of the tail, nine inches.

At the base of the fleshy portion of the Caudal fin, a deep groove on each side, running half the length of this portion. Caudal fin unequal in its lobes; the upper, measuring along its curve, twenty-three inches; the lower, eighteen. Depth of the caudal fin at its extremities, two and a half feet.

Near the anus, imbedded in the flesh, I found a specimen of the "*Anthosoma Smithii*" of Leach.

Large specimens of this shark, which is usually found only three or four feet long, have been mistaken for the "*Carcharias glaucus*," Blue Shark, by our fishermen. Although the Blue Shark may exist in our waters, still as I have not been able to meet with it, nor with any one who has seen it, upon whose scientific accuracy I can implicitly rely, I have erased it from our catalogue, and substituted this species. The remarks made in my former report are applicable here, and are, therefore, introduced.

SPINAX. CUV.

Generic characters. *Two dorsal fins, with a strong spine at the anterior edge of each; no anal fin; temporal orifices present; teeth in several rows, small and cutting.*

S. *acanthias*. Lin. *The picked Dog-fish.*

Pennant's British Zoology, vol. iv. p. 88.
Shaw's Zoology, vol. v. pt. ii. p. 33.
Mc Murtrie's Cuv. vol. ii. p. 288.
Yarrell's British Fishes, vol. ii. p. 400, et fig.

This species is known in Great Britain by the name of "*Picked* or *Piked Dog*," from the strong spine at the commencement of each dorsal fin. Our fishermen called it "*Dog-fish.*" In the spring and autumn, the dog-fish appear in shoals in our bay: they are frequently met with in immense numbers. At their appearance, smacks are fitted out at Truro and Provincetown for their capture, to the neglect of other fishing, for the *oil* they furnish; and it is said to be quite a lucrative business. The fishes themselves are dried for *food* for the cattle, and their *skin* is considerably used for polishing, by the mechanic. They average about eight or ten pounds weight; sometimes they weigh fifteen pounds. They are readily caught with the hook. These shoals seldom remain in shallow water, or near the shore, more than three or four days; they feed upon the offal and garbage thrown upon the bottom by the fishermen, and so perfectly do they clean the ground, that it is observed by old fishermen, that when the spring shoal of dog-fish has been unusually large, the cod fish are found in much larger numbers upon the same localities afterwards. In Scotland, the flesh of this fish is much eaten by the lower classes, and the refuse portions afford a valuable manure.

A fine specimen before me, thirty-four inches in length, presents the following appearances: All the upper part of the body of a slate color, which is deeper upon the head; lighter below the lateral line; beneath, white; just under the lateral line, a row of circular white spots; a few similar spots irregularly distributed upon the back. Length of the head to the whole length of the fish, nearly as 4 to 9; the head flattened above, tapering to a blunted snout. ***Eyes*** horizontally elongated; their longest diameter nearly equal to one fourth the length of the head; pupils small, black; irides silvery, with a cupreous tint. Orbit large, allowing great motion to the eye. The distance between the eyes equal to more than half the length of the head. Between the eyes, two longitudinal patches of numerous mucous glands, which are indistinctly continued nearly to the extremity of the snout. Temporal orifices back of the eye, and just above the line of the eye; their length is equal to the short diameter of the eye. All the lower portion of the head in front of the mouth sprinkled over with mucous orifices, which, like those between the eyes, exude, when pressed, a gelatinous secretion. *Nostrils* double. *Mouth* large; when expanded, nearly circular. In the upper jaw, three rows of teeth; in the lower jaw, two rows; these teeth have very sharp edges, and their points are turned outwardly from the centre of the jaw. Branchial orifices five, directly in front of the pectorals. *Lateral line,* quite high up on the back, and running nearly a straight course to the caudal rays.

The first Dorsal fin arises from the anterior third of the body; it is convex before, concave above and behind; nearly one third higher than long; arising from its anterior base, and concealed in nearly half of its height by the fin, is seen a strong triangular spine, nearly half the height of the fin.

The second Dorsal is situated back of the first dorsal, at a distance from it, equal to one fourth the whole length of the fish; of the same form as the first, but much smaller. A spine, similar in its form and situation with regard to the fin, is seen here as in the first dorsal fin, nearly as high as the fin itself.

The Pectorals are large, commencing at the last branchial orifice; their length, less than half their height.

The Ventrals are small, situated just before the second dorsal, with the anus between them.

The Caudal fin is very large and powerful; its upper portion is broad, and twice the length of the lower portion.

The young of this species are much more spotted than the adults. A fœtus before me, nine inches long, has several white spots on the top of the shoulders; two in front of, and two just behind the first dorsal fin; also spots on the sides, which, becoming confluent, form a white band extending almost the whole length of the body.

SOMNIOSUS. Le Sueur.

Generic characters. *Like Spinax they have no spiracles, no anal fins, five small branchial aper-*

tures, approximating, and near the pectorals, but they differ in having a short obtuse snout. Pectoral, ventral and dorsal fins very small; dorsals without spines, caudal as in Spinax.

S. *brevipinna.* Le Sueur. *The Nurse, or Sleeper.*
Journal Academy Nat. Sciences, vol. i. p. 222, et fig.

In a paper upon the "*Chondropterigious fishes*" contained in the first volume of the "Journal of the Academy of Natural Sciences of Philadelphia," Le Sueur observes, "Near Marblehead in Massachusetts, the fishermen take a kind of *shark* which they call *Nurse*, or *Sleeper*, doubtless from its inactive or sluggish habits. It is considered rare on their coast. From a skin recently prepared by them, I have been enabled to make the following observations:

Lateral line black, undulating at the head, and marked in its whole length with small transverse lines; *tail* wide, emarginate; the first dorsal midway between the pectoral and the anal fins, the second a little further than the ventrals, and both very near the tail. *Body* elongated, with a slight elevation, and narrow at the tail; spiracles distant from the eyes, and more elevated; *eyes* small, round, and situated laterally; the pectoral fins, which were larger than the others, except the caudal, were four inches at the base, and at most five inches in length. This individual, from the end of the snout to that of the tail, was six feet five inches long; and we may regard it as a shark with very small fins, whence its motion must be slow, and confined to the bottom, there sluggishly seeking its prey. Skin rough, beset with triangular, curved, striated and pointed asperities. Color of the entire body, a pale lead gray, somewhat darker on the back."

I have not had the good fortune to see a specimen of the *nurse*, or to meet with a fisherman who knew any thing respecting it. It is not, however, at all surprising, that it should be unknown: with most of our fishermen, a shark is a shark, without regard to specific names. The "*hammer head*," and "*thresher*," and "*mackerel shark*," are, it is true, known to many of them ; but so little do they feel interested in any species of fish which is not marketable, that they take no notice of their distinguishing characters ; and a species might often frequent our waters without being known, unless it differed *exceedingly* from a common fish.

FAMILY II.

RAIIDAE.

RAIA. CUV.

Generic characters. *Form of the body rhomboidal, very much depressed ; tail long and slender, generally armed on the upper surface with one or more rows of sharp spines ; two small fins near the end of the tail, and sometimes a small terminal or caudal fin ; the eyes and temporal orifices on the upper surfice of the head ; nostrils, mouth and branchial apertures, beneath ; teeth flattened, lozenge-shaped, the inner angle elongated in old males.*

R. *ocellata.* Mitchell. *The ocellated Ray.*

Trans. Lit. et Philosoph. Soc. vol. i. p. 477.

This species, described by Mitchell in his "Fishes of New York," is sometimes met with in our waters, weighing 200 pounds. The following description is drawn up from a female specimen *thirty-one* inches in length :

Body above, of a light brown color, thickly sprinkled over its entire surface with circular black spots, varying in size from half a line to two lines in diameter. Width across the pectorals, thirty inches; width of the *head*, directly back of the eyes, twelve inches ; distance between the eyes, about two inches. *Eyes*, situated horizontally, two thirds of an inch in diameter ; pupils black ; irides yellowish, beautifully radiated with golden, resembling slips of gold leaf ; orbitar ridge covered with very small spines. *Snout* slightly projecting. On each side of the snout, a slight marginal excavation. Temporal orifices directly back of the eyes, situated obliquely, one inch in length. *Mouth* measures from outer angle, three inches across ; *teeth* placed in the quincunx. *Nostrils* directly in front of the mouth, large and protected by fleshy prolongations. From the tip of the snout to a point opposite the first branchial opening, the margin of the pectorals on each side, are rough to the touch. The branchial openings, five in number, situated at equal distances from each other. Body beneath, white ; in front of, and at the sides of the mouth, and at the anterior portion of the pectoral fins, are seen a great number of minute black points, which are mucous pores. All the space directly in front of the eyes, save the extremity of the snout, naked and reddish, appearing as if abraded. Skin between the eyes destitute of spines, as well as a space on each side of the spines, commencing in front of the eyes, of two or more inches in width, and continued to the extremity of the ventral fin; space between the eyes also, and the upper part of the entire length of the tail, spineless. The remainder of the upper surface of the body, save the margin of the pectorals and ventrals, is covered with sharp recurved spines, of which the largest are seen on the sides of the tail. The anterior portion of the pectorals, reddish at the edges; posterior portion bordered with white; rays very numerous, and easily distinguished. Ventrals quite large, containing about twenty-four rays; those next to the pectorals very strong, with their extremities lobed; these fins resemble very much the posterior wings of some of the "Phalenæ." The tail, measured from the anus, is fifteen inches in length; on each side of it, are three rows of strong spines; these spines commence high upon the back, but are at first quite small, and gradually increase in size; at the lower or under edge of the tail, is a fleshy border or fringe. Two small dorsal fins are situated upon the tail, near its extremity; the anterior, is nearly as long again as high; it is united at its base posteriorly to the smaller fin. At the origin of each of these fins, is a fleshy tubercle. Anus large.

In another specimen of this ray, I found the stomach filled with a species of the genus " *Talitrus*," *Beach flea.*

The sexes are readily distinguishable by the ventral fins. From the ventral fins in the male, extends a cylindrical appendage about half the length of the tail, measuring from the anal orifice, which is called the *clasper ;* at its posterior, outer portion, it is fissured, and contains on its lower division a large falciform bony hook, and on the upper, a small projecting tooth, somewhat like a shark's tooth; the ventrals of the female have not these appendages. Besides this *sexual character*, there are, in the female, fewer spines upon the surface of the body generally, and particularly upon the fleshy portions of the pectorals. The anal orifice of the *male*, is circular; of the *female*, a simple incision; the teeth of the female are more prominent, and sharper; the male has fewer spots.

R. *batis.* Lin. *The Skate.*

Pennant's British Zoology, vol. iv. p. 72, et fig.
Mc Murtrie's Cuv. vol. ii. p. 293.
Yarrell's British Fishes, vol. ii. p. 421, et fig.

This species sometimes attains the weight of 200 pounds. From a female specimen, three feet three inches in length, and two feet in width from the extreme points of the pectorals, brought me by my brother-in-law, Thomas M. Brewer, M. D., I have made the following description:

Above, of a light ash color, sprinkled over its entire surface, with blackish ocellated spots, more or less large. Margin of the pectorals, reddish. Upon the anterior angle of the eyes, upon the upper orbitar margin, and also at the posterior margin, a number of very small spines; the hindermost, smallest. A few spines are also observed upon the anterior margin of the pectoral fins; the remainder of the pectorals naked, with the exception of a small number of very minute spines at the posterior base, just in front of the ventral fins. A single row of spines, larger than are found upon any other part of the body, arm the dorsum of the tail, commencing a short distance before the origin of the ventrals, and continue to the second dorsal fin, with the exception of the space occupied by the first dorsal. A row of rather smaller spines is situated on each marginal edge of the tail, commencing on a line with the posterior angle of the ventrals. Length of the *head*, to the entire length of the fish, nearly as 1 to 4. *Eyes* moderate in size, oblong; pupils black; irides silvery, with a beautiful golden fringed curtain suspended from above. Distance between the eyes, nearly one fourth the length of the head. A slight depression on the top of the head, extending a considerable distance forwards towards the snout. Top of the snout covered with small flexible spines; extremity of the snout, naked. Anterior portion of the body tapering from the lateral angle of the pectorals to nearly a point at the snout; snout slightly blunted. Width of the head, across the humeral orifices, thirteen inches; width directly in front of the eyes, ten inches; across the top of the snout, one inch. Humeral orifices directly back of the eyes; and in their transverse diameter equal to the length of the eye. The ventrals lighter colored than the rest of the body; the rays digitated at the extremities. The dorsal fins equal in length; the anterior a little higher than the posterior; both rounded; separated about half an inch; the posterior terminates within an inch of the extremity of the tail, by a membranous prolongation, which is more elevated at the posterior extremity. All the under portion of the body, of a dingy white color, perfectly smooth, with the exception of a very few spines, hardly perceptible except by the touch, on each side of the commencement of the caudal fins, and a small patch of equally minute spines upon the middle of the tail, just in front of the termination of the ventral fins. Mucous pores are scattered over the greater portion of the under surface, appearing like black dots, in most instances distributed in a regular manner, although a longitudinal line of them is seen towards the middle of the pectorals, and another transverse one at the base of the ventrals. Gape of the mouth, large. Jaws composed of compact, hexaedral teeth, forming almost a plane surface, the inner angle of the innermost middle ones beginning to become acute. Nostrils, a short distance in front of the mouth; this distance is equal to half the length of the mouth. Five branchial apertures, situated obliquely; the anterior largest, the posterior much the smallest. The pectoral rays, very obvious beneath. Anal opening, oblong.

A *male* specimen lying before me, 54 inches long and 36 inches wide, kindly sent me from New Bedford, by Wm. H. Taylor, Esq., presents some dissimilarities to the above. The ocellated spots do not exist, but the individual is of an uniform light brown color. On the margin of the pectorals, on a line opposite the eye, are from four to six longitudinal rows of strong recurved spines; on the back of the pectorals, towards the lateral angle, are four or five longitudinal rows of spines directed towards the dorsum of the fish. All the under surface of the snout to the nostrils, and exterior to the nostrils to the angle of the jaws, roughened with innumerable small tubercles. The teeth have become very sharp; their middle portions present an acute angle; they are recurved, and exhibit regular rows passing backwards, with a space of a line or more between them. The bony process contained in the claspers, is four inches long, and half an inch deep at the posterior extremity. The outer margin is festooned, and naked, about two lines of its depth; the inner half of the width, is covered with corrugated flesh.

FAMILY.

SUCTORII.

PETROMYZON. Lin.

Generic characters. *Body smooth, elongated, cylindrical, like that of an eel; the head, rounded; the mouth circular, armed with hard tooth-like processes; the lip forming a continuous circle round*

the mouth; seven apertures on each side of the neck, leading to seven branchial cells; no pectoral or ventral fins; the skin towards the tail extending in a fold from the body both above and below, forms dorsal, anal, and caudal fins.

P. *Americanus*. Le Sueur. *The American Lamprey.*

Trans. of Amer. Phil. Soc. new series, vol. i. p. 382.

This species, which is far from being common in our Bay, is taken in deep water, attached to pieces of drift wood, and the bottoms of boats and vessels. In its spawning season, it ascends the numerous rivers. It is taken in large quantities in the Merrimack river, at Lowell. Dr. Elisha Bartlett writes me, that "they ascend the rivers a little earlier than the shad, and move mostly in the night. It is not known, by the fishermen, when they return, as they are never seen. There is a notion that they all die. They are often seen, in the summer, in pairs, at work together, constructing a little mound of stones. They build this about three feet in diameter at the base, and about two feet high, of stones from the size of an ounce bullet to that of the fist. They often aid each other in carrying the same stone. This is pretty evidently a *labor of love*, as they copulate once in five minutes, or so, during the whole time. The young go down the river, when the water begins to freeze. They are then from six to eight inches long."

It occasionally attains the weight of four pounds.

From a beautiful specimen 27 inches in length, brought me by Capt. Samuel Andrews, of Charlestown, the following description is drawn up:

Color, olive brown; all the upper portion of the *body*, mottled with dark brown, almost black, confluent patches; beneath, of an uniform dull olive. Anterior portion of the body, cylindrical; posterior, compressed. A slight keel upon the back. *Head* rounded, somewhat flattened on the upper portion in front of the eyes. *Eyes*, moderate in size; pupils, black; irides, golden. Distance of the eyes from the snout, two inches. A tubular orifice is seen in front of, between the eyes, a line in its longest diameter. Seven large branchial apertures back of each eye, passing backward in nearly a straight line: the first, smallest. When this species is unattached, the mouth is a longitudinal fissure. When attached, it is circular, the lip forming a ring; within, furnished with hard, horny teeth, of a yellow color. *Teeth* on the roof, larger than those upon the sides of the mouth; lower margin of the mouth furnished with a semicircular row of compact teeth; teeth on the lip, small; mucous pores obvious in front of the eyes, passing towards the snout, and almost back of the eyes. Two dorsal fins; the first, commencing back of the middle of the body, three inches long, nine inches high. Between this and the second dorsal, one inch. Second dorsal, six inches long; more than an inch high, in its highest part. Anal fin, a mere fringe. Caudal fin, appears like the extremity of the solid portion of the body, very much compressed.

P. *nigricans.* Le Sueur. *The bluish Lamprey.*

Trans. of Amer. Phil. Soc. new series, vol. i. p. 385.

This species is generally found attached to other species of fishes; it is frequently affixed to *mackerel;* less often to *cod;* and the three specimens I have met with, were taken adhering to *haddock.* From the largest of these, seven inches in length, the following description is made: Upper part of the *body*, of a deep blue color; beneath, bluish white. Anterior third of the body, cylindrical; back of this, compressed; very much so towards the tail. *Head* oval, flattened on the top; length of the head, from the snout to the posterior angle of the eye, to the length of the fish, less than one seventh. Seven branchial orifices, running obliquely backwards and downwards from the eyes. *Mouth*, circular; half an inch in diameter; surrounded by a fleshy margin; armed within with numerous incurved teeth, or horny spines, projecting from widened bases, resembling the spines with which the *Raiae* are armed. There are three teeth in the throat; two higher up than the third, which is in front of and between the others. In the general appearance of the teeth, there is great resemblance between those of this species and the preceding. *Eyes* moderate in size; pupils black; irides silvery. Between the eyes, on the top of the head, a small white spot; in front of this spot, a spiracle.

The first Dorsal fin commences back of the middle of the fish; its posterior portion is rounded; its height to its length, as 2 to 8. The distance between the dorsals, is equal to half the length of the first dorsal.

The second Dorsal is considerably higher than the first; before reaching the caudal fin, to which it is continued, it is depressed.

The Caudal fin is a simple membrane, triangular at its termination, and uniting with the anal fin, which is very small. Anus small.

Le Sueur dwells upon the "*white dorsal fins*;" his specimen was six inches long. My three specimens, one, five inches, a second, six inches in length, have both dorsals perfectly white; in the specimen just described, seven inches long, the margin of the second dorsal is of the same color as the back of the fish.

AMMOCOETES. Dumer.

Generic characters. *Form of the body, the branchial apertures and fins, like those of the Lampreys; upper lip semi-circular, with a straight, transverse under lip; mouth without teeth, but furnished with numerous short membranous cirrhi.*

A. *bicolor. The Mud Lamprey.*

Trans. of Amer. Phil. Soc. new series, vol. i. p. 386.

I have never been able to procure this species, and therefore extract Le Sueur's description, drawn up from a specimen sent him from Northampton, by Dr. Hunt, which was taken in the Connecticut river:

"Dorsal fins low, separated; the second united with the caudal fin, which is rounded; back and sides, reddish; abdomen white; the color separated by an undulating line. Anterior part of the body subcylindric, posterior part compressed, and tapering to the tail; nape of the neck elevated; head declivous, prolonged into a snout furnished with a lip having two short rounded lobes; these lobes, when the mouth is closed, embrace and conceal the lower lip which is very short; the nostrils are small, and placed in the centre of a white oval, pellucid disk, easily moveable; on the inside of the upper lip, there are small granules, and at the opening of the throat small ramified papillae; the branchial apertures are placed in a longitudinal depression, oblique and a little curved, the first aperture is above the angle of the mouth; on each side of the head there is a whitish spot, which should seem to indicate the position of the eyes, that this species is deficient of, in common with the "P. *ruber*"[*] of Europe. The annular or ribbed appearance of the sides of this fish is owing to the muscles, which are endued with great strength, in order to enable it to burrow in the muddy sands of rivers, where it penetrates in a serpentine manner, by means of its snout, the large lip of which performs the functions of a terrier. The European species is generally taken, when the small rivers are cleansed of the superabundant sand

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[*] "Lampetra caeca; Willughby, p. 107, C. 3, fig. 1. Pet. rouge; La Cepede, tome ii. page 100."

and mud which obstruct their channels. This last is much sought after for food; but the American species is commonly rejected, as is almost every animal that either has a real or fancied resemblance to a snake. This fish is used for bait."

Besides the species above described, several others are known to be found in our waters, but they have not been described, and I have not met with them myself. I shall but cursorily notice them.

A second species of "*Pomotis*," ***Pond perch***, is occasionally taken in the neighboring ponds, with the "*vulgaris*."

Another species of "*Esox*," ***Pike***, is taken with the "*reticulatus*;" it differs from that fish, in being transversely barred. It is rarely brought to our market. My friend, Dr. Holbrook, of Charleston, a very accurate naturalist, tells me he has frequently caught it at Wrentham.

A species of "*Exocetus*," is sometimes taken upon our coast; this may prove to be one of the species, described by Le Sueur, in the second volume of the "Journal of the Academy of Natural Sciences."

Another species of "*Salmo*"—***Trout***, is, I am satisfied, from the representations of correspondents and fishermen, found in our state. I have repeatedly seen a fine large trout from Winnipiseogee Lake in New Hampshire, and two beautiful species at least, from Sebago Pond in Maine, in our market;

but have met myself with but one species taken in our waters.

A larger "*Eel*" than the species I have described, is found at Holmes Hole. Dr. Yale writes me that "a *Sea eel*, weighing from twelve to fifteen pounds, is not unfrequently taken about Noman's Land, by the fishermen, and is considered good eating." He has seen but one specimen, and that was taken some years ago in the Vineyard sound.

Dr. Yale tells me that a species of "*Zygæna*"—*Hammer-headed shark*, is common at Holmes Hole.

A species of "*Trygon*" is met with also, at Holmes Hole. Thus Dr. Yale writes me, "I have seen frequently in this harbor and have assisted in taking them, but owing to their poisonous nature when wounded by their sting, we have been rather cautious about taking them into the boats; so that we seldom see one on shore. One or two individuals in this vicinity have come well nigh losing their lives by a wound from them. In July and August they are abundant on the flats in the harbor here." In the first volume of the "Journal of the Academy of Natural Sciences," Le Sueur describes three species of "*Raia*," one found at Newport, R. I., and two at Egg Harbor, N. J. These all evidently belong to the genus "*Trygon*," Adans.; and as the species belonging to this genus are commonly called "*Sting rays*," this species spoken of by Dr. Yale, is much more likely to be one of these, found in neighboring waters, than one known to exist at a distance of thousands of miles; therefore I shall not allow the "*pastinaca*," the European species, is our fish, until some naturalist may have settled the matter satisfactorily.

Another species of "*Raia*" is common in our waters. It is known among fishermen, as the *Thornback*. Several years since, I had an opportunity of examining one, which, at the time, I supposed to be the "*radiata*" of Donovan. This specimen was two feet in length, and twenty inches across the pectorals; and in its stomach, I found the head of a *menhaden*, measuring three inches in length. The fisherman who brought it to me, assured me he had caught specimens very much larger than this. This species is undoubtedly the "*clavata*," *thornback*, or "*radiata*," *Starry ray*.

That a species of "*Torpedo*" is found upon the coast of Cape Cod, is, I think, satisfactorily settled by the following testimony:

In Whitman's description of *Wellfleet*, in the third volume of the "Massachusetts Historical Collections," he says, "Cramp fish have been caught on our shores." In a description of *Truro*, in the same volume, we read, "The cramp fish has sometimes been seen on the beach." "This fish, which resembles a *sting ray* in size and form, possesses the property of the *torpedo*, being capable of giving a distinct electrical shock." Dr. Davis writes me from South Wellfleet, under date of October 24, 1837: "Cramp fish are occasionally seen upon our shores." Mr. E. Freeman, fishmonger in Quincy market, tells me that forty years ago, two or three specimens of this fish were frequently found dead upon the beaches at Wellfleet in a single day, also at Griffin's

Island, near Wellfleet. They were taken for their *livers*, which are thought beneficial in cases of cramp. He has not, however, heard of any one having been taken for several years past. Mr. Covell also informs me, that he has repeatedly seen them, and been electrified by them at Wellfleet; but has not met with one for ten or twelve years. Mr. Newcomb, sen., relates an anecdote, which proves the electrical power of this fish beyond a doubt. His father, who resided at Wellfleet, had a dog which frequently waded into the shallow water of the coves, and brought out *flounders*, which he had seized with his mouth. In one of his fishing excursions, he attacked a *torpedo*, which perfectly convulsed him; he dropped the fish, and ran away howling most piteously, and could never afterward be persuaded to resume his fishing. The last three gentlemen I have had occasion to refer to before. They are men of unimpeachable veracity, and I take great pleasure in acknowledging my obligations to them.

These are all the species found in our waters, of which I have any knowledge. Many of the species, however, described by Le Sueur, as found on the coast of Rhode Island; and by Mitchell, as inhabitants of the waters of New York, will undoubtedly be discovered in and about Buzzard's Bay. And even in the cold waters north of "the Cape," rich acquisitions may reasonably be expected by the ichthyologist, who has the leisure and the zeal for minute and accurate observation.

July 11*th*, 1839. Since this paper has passed through the press, I have had an opportunity to examine a specimen of the "Carcharias obscurus," which I admitted upon page 533, from having received several *serrated teeth*, which I felt persuaded belonged to that species. The description of Le Sueur being rather concise, I would add a few words.

The fish just examined was taken yesterday in a net at Nahant. Its length is 9½ feet; its weight 800 lbs. All the upper part of the body is of a dark brown color, rather lighter than the *mackerel shark:* the neck and abdomen are of a dirty white. Gape of the mouth very large. A single row of sixteen triangular serrate teeth in the upper jaw; those in the middle of the jaw, one inch and two lines high, and one inch wide at their base; those towards the angle of the jaw, smaller. Two rows of teeth in the lower jaw, similar in their form and number, but smaller than those in the upper jaw.

The first Dorsal fin is one foot in length.

The second Dorsal is one inch long.

The Pectoral fins are two feet high, one foot long, and are falciform.

The Ventrals are seven inches long.

The Anal fin is one inch long.

The upper lobe of the Caudal fin measures two feet over its curvature; the lower lobe measures one foot and a half.

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ERRATA.

Page 1, for DESCRIPTION, read DESCRIPTIONS.
" for ANGICOLLIS, read RUGICOLLIS.
20, for TENEBRIO (UPIS,) read ŒDEMERA (DYTILUS.)
33, in the Note, for *Necydalus melanira*, read *Necydalis melanura.*
34, for CHLŒNIUS, read CHLÆNIUS.
35, for CHLŒNIUS, read CHLÆNIUS.
38, for SUBRUFA, read SUBRUFUS.
51, last line but one, for the yellow spots, read three yellow spots.
159, first line, for *pretnuis*, read *pretenuis.*
187, for fig. 9, read fig. 14.
199, lines 7 and 8, for circumstance give, read character gives.
254, line 16, for γ, read G.
261, lines 11, 18, and 27, for Bœomyces, read Bæomyces.
262, first line, for Bœomyces, read Bæomyces.
" line 9, erase the comma.
283, for *Jamina*, read *Jaminia.*
337, first line, for *Argyreps*, read *argyreps.*
346, for *elongated*, read elongated.
359, for *Coryphæna*, read *Coryphæna.*
370, for *subbifurcatus*, read·*sub-bifurcatus.*
" for *subbifurcated*, read *sub-bifurcated.*
378, first line, for *tritacea*, read *triticea.*
437, for *alewive*, read *alewife.*
439, for *Alewive*, read *Alewife.*
448, for SUBRACHIATI, read SUBBRACHIATI.
458, for *Minuta*, read *minuta.*
487, below A. *mollis*. Mitchell, insert Trans. Lit. & Philos. Soc. N. Y.
vol. i. p. 388.
490, third line, after subgenus, erase the period.
501, for *tobianus*, read *Tobianus.*
544, for "Phalenæ," read *Phalæna.*

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ERRATA.

Page 1, for DESCRIPTION, read DESCRIPTIONS.
" for ANGICOLLIS, read RUGICOLLIS.
20, for TENEBRIO (UPIS,) read ŒDEMERA (DYTILUS.)
33, in the Note, for *Necydalus melanira*, read *Necydalis melanura*.
34, for CHLŒNIUS, read CHLÆNIUS.
35, for CHLŒNIUS, read CHLÆNIUS.
38, for SUBRUFA, read SUBRUFUS.
51, last line but one, for the yellow spots, read three yellow spots.
159, first line, for *pretauis*, read *pretenuis*.
187, for fig. 9, read fig. 14.
199, lines 7 and 8, for circumstance give, read character gives.
254, line 16, for γ, read G.
261, lines 11, 18, and 27, for Bœomyces, read Bæomyces.
262, first line, for Bœomyces, read Bæomyces.
" line 9, erase the comma.
283, for *Jamina*, read *Jaminia*.
337, first line, for *Argyreps*, read *argyreps*.
346, for *elongated*, read elongated.
359, for *Coryphœna*, read *Coryphæna*.
370, for *subbifurcatus*, read *sub-bifurcatus*.
" for *subbifurcated*, read *sub-bifurcated*.
378, first line, for *tritacea*, read *triticea*.
437, for *alewive*, read *alewife*.
439, for *Alewive*, read *Alewife*.
448, for SUBRACHIATI, read SUBBRACHIATI.
458, for *Minuta*, read *minuta*.
487, below A. *mollis*. Mitchell, insert Trans. Lit. & Philos. Soc. N. Y. vol. i. p. 388.
490, third line, after subgenus, erase the period.
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544, for "Phalenæ," read *Phalena*.

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———— interrupta, . . [illegible]

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———— erosa, . . . [illegible]
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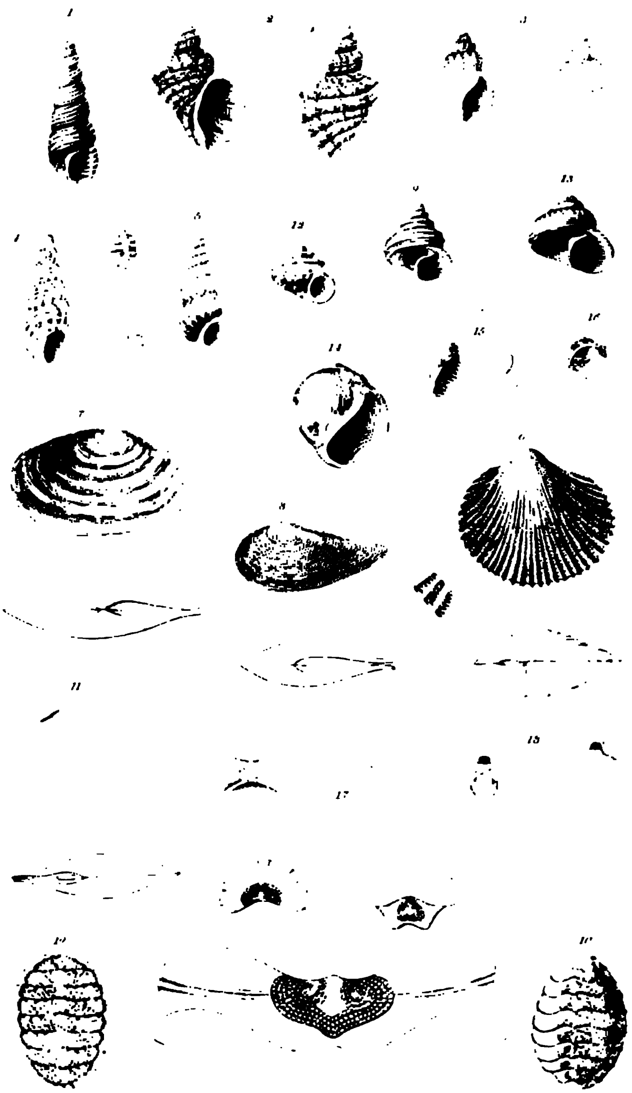
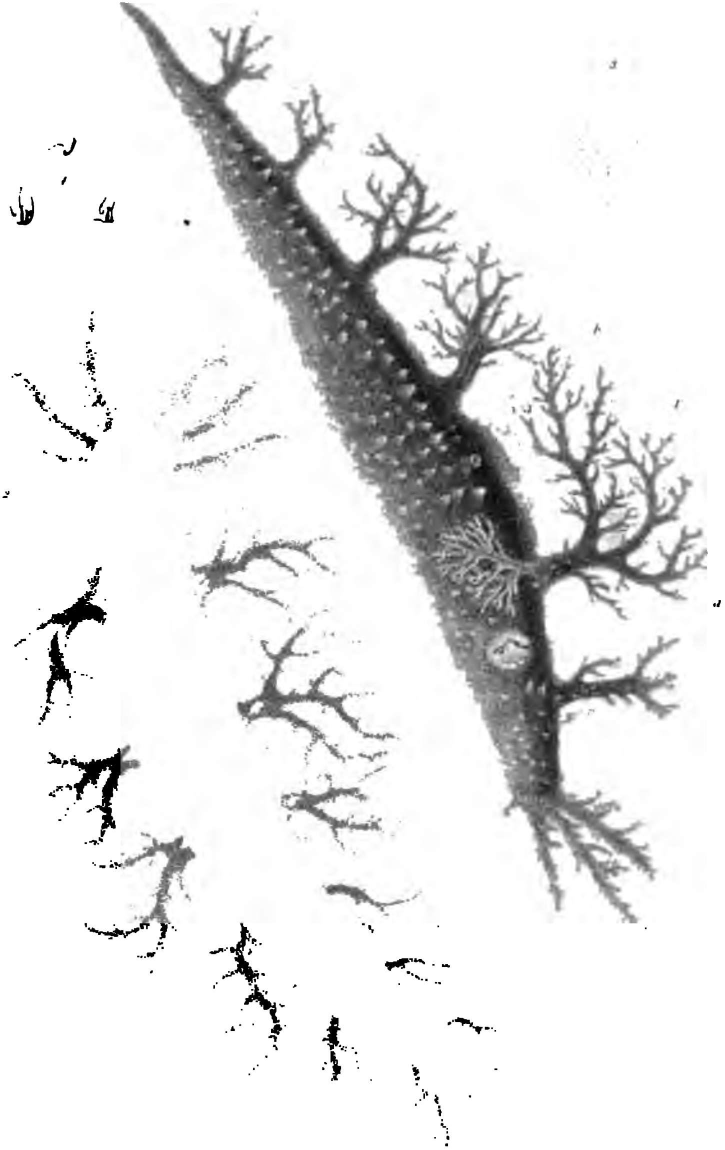
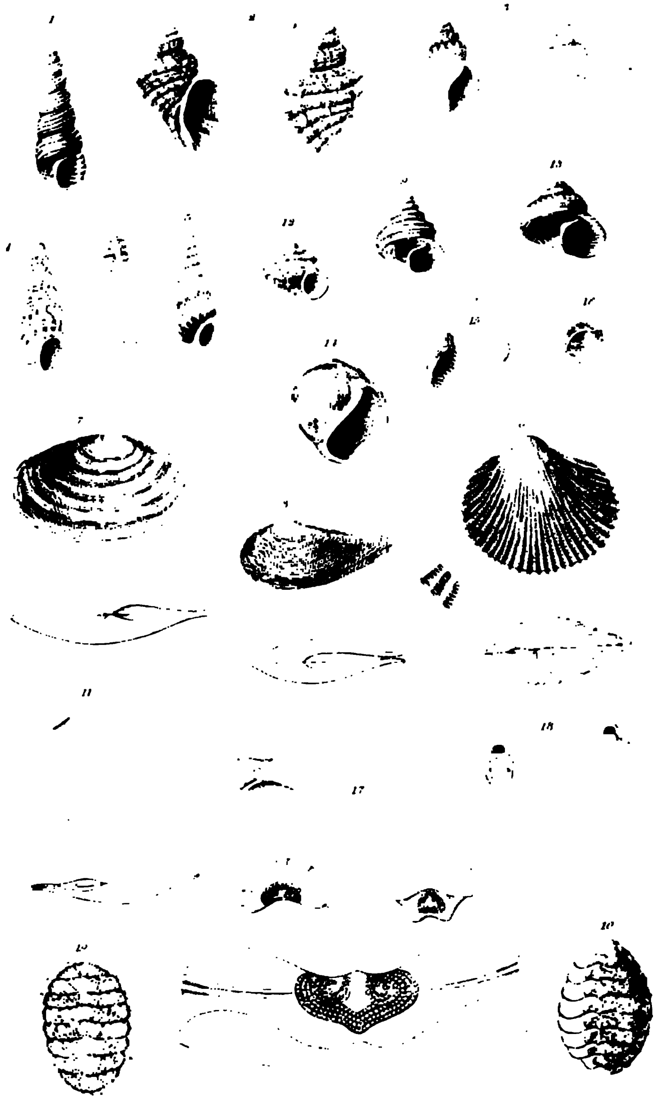


1. TURRITELLA	*erosa.*	COUTHOUY.
2. TRICHOTROPIS	*costellatus.*	..
3. CANCELLARIA	*buccinoides.*	..
4. SCALARIA	*subulata.*	..
5. ..	*Novangliae*	..
6. CARDIUM	*pubescens*	..
7. NUCULA	*myalis*	..
8	*tenuisulcata.*	..
9 TURBO	*cinereus*	..
10. CHITON	*Emersonii.*	..
11. TELLINA	*sordida*	COUTHOUY.
12. TURBO	*obscurus.*	..
13.	*incarnatus*	..
14. NATICA	*consolidata.*	..
15. BULLA	*hiemalis.*	.. MSS.
16 OXINOE	*glabra.*	..
17 PATELLA.	*candida.*	..
18. TEREBRATULA	*Septentrionalis*	..
19. CHITON	*fulminatus.*	..



1.2 TRITONIA *Reynoldsii* COUTHOUY
3 *One of the tentacula magnified to about 5 times nat. size*
4 *The jaws seen in different positions*
a genital orifice
b anal do



		COUTHOUY.			COUTHOUY.
1. TURRITELLA	*erosa.*		11. TELLINA	*sordida.*	
2. TRICHOTROPIS	*costellatus*	..	12. TURBO	*obscurus.*	..
3. CANCELLARIA	*buccinoides.*	..	13.	*incarnatus*	..
4. SCALARIA	*subulata.*	..	14. NATICA	*canaliculata.*	..
5.	*Novangliae.*	..	15. BULLA	*lineolata.*	..
6. CARDIUM	*pubescens*	..	16. OXINOE	*glabra.*	..
7. NUCULA	*myalis.*	..	17. PATELLA	*candida.*	..
8	*tenuisulcata.*	..	18. TEREBRATULA	*Septentrionalis*	..
9. TURBO	*cinereus*	..	19. CHITON	*fulminatus*	..
10. CHITON	*Emersonii.*	..			

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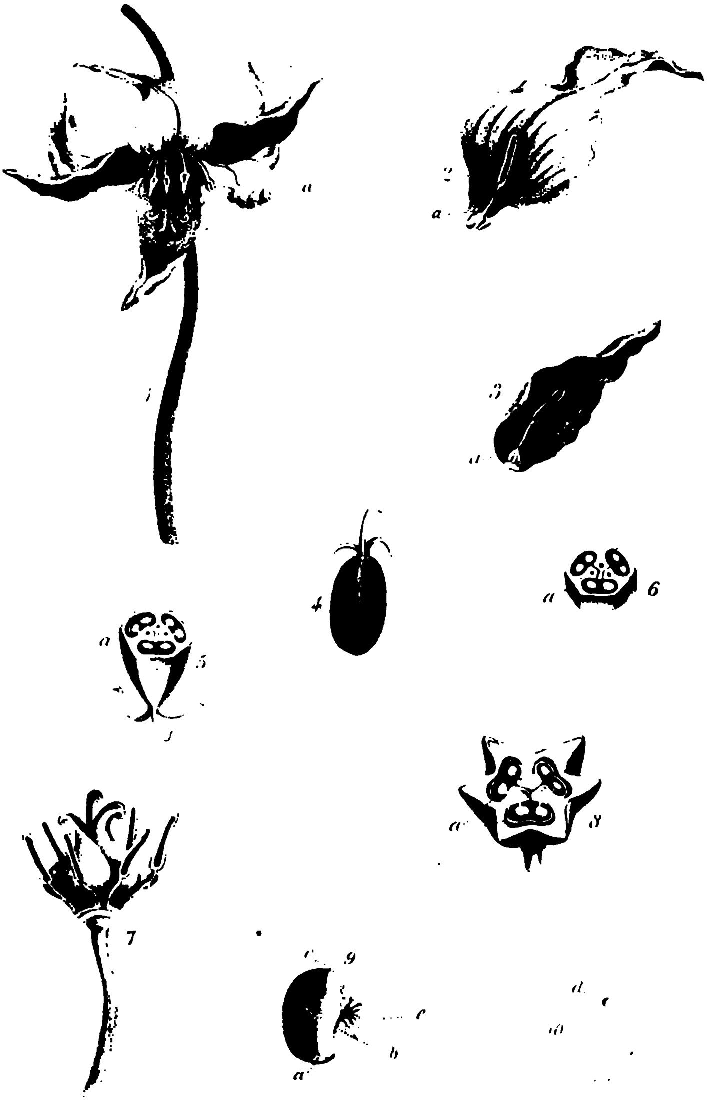
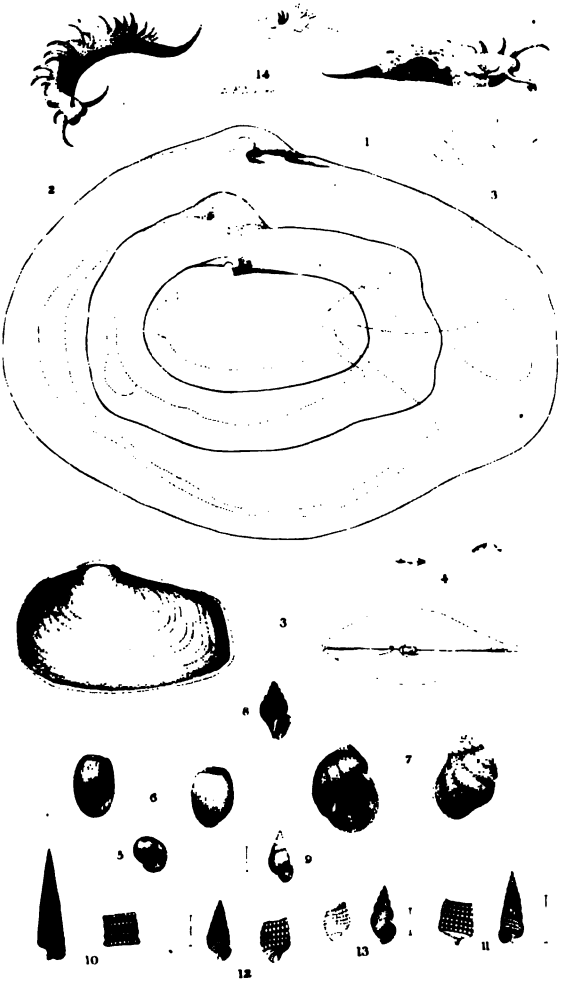


Teschemacher del. T. Moore's Lith. Boston

Fig 1. T. CERNUUM with multiplication of parts. a antheriferous petal 2 Petal of do a. adhesion of the stamen. 3. Sepal of do. a adhesion of stamen. 4.5 6 Ovarium of do and sections; flower a week old. a. tube for the passage of pollen. 7.8. Ovarium of T. ERECTUM, flower ten days old; and section a. sacs formed by the endocarp, inclosing ovula. 9. 10. Seed ripe (magnified) and section. a chalaza b. raphe with the vessels branching off. c. foramen. d embryo e. pulpy mass.



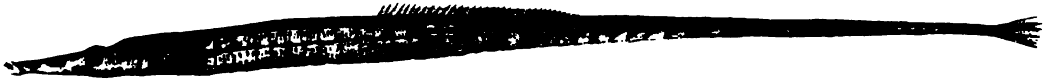
1. THRACIA *corbuloides* DESHAYES.
2 .... *Conradi* .... COUTHOUY.
3 .... *similis* .... —
4 NUCULA *navicularis* .... —
5. BULLA ...... *hiemalis* .... —
6 .... *Gouldii* .... —
7 ANCULOTUS *dentatus* COUTHOUY.
8. PLEUROTOMA *decussata* .... —
9. PYRAMIS *fusca* .... ADAMS.
10 CERITHIUM *Emersonii* .... —
11. .... *nigrocinctum* .... —
12. .... *Greenii* .... —
13. JAMINIA *seminuda* ADAMS
14. EOLIS ...... *diversa* ..COUTHOUY.

A A Gould Del.^t C W Torbett Sc

Pl. IV

Fig 1

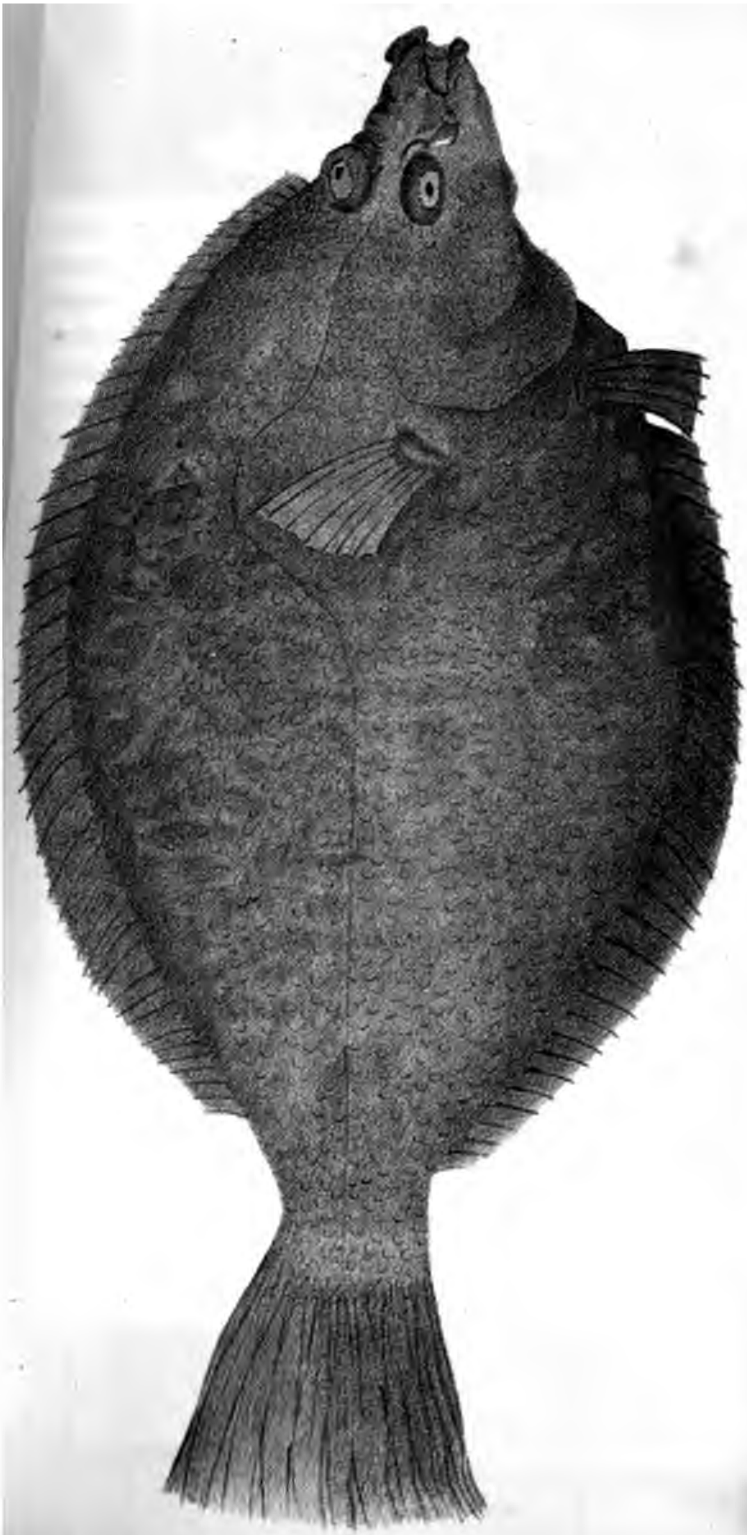
Fig 2



J. Wyman M.D. del.

Fig 1. Aspidophoroides monopterygius Cuv.
2 Syngnathus Peckianus Storer

Tho. Moore's Lith. Boston



Platessa ferruginea *Storer.*

Wyman M.D. del.

Fig 1